

ORTHOPAEDIC

Physical Therapy Practice



American Physical Therapy Association
The Science of Healing. The Art of Caring.

THE MAGAZINE OF THE
ORTHOPAEDIC SECTION, APTA



VOL. 24, NO. 2 2012

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To serve as an advocate and resource for the practice of Orthopaedic Physical Therapy by fostering quality patient/client care and promoting professional growth.

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Publication Title: *Orthopaedic Physical Therapy Practice* Statement of Frequency: Quarterly; January, April, July, and October

Authorized Organization's Name and Address: Orthopaedic Section, APTA, Inc., 2920 East Avenue South, Suite 200, La Crosse, WI 54601-7202

Orthopaedic Physical Therapy Practice (ISSN 1532-0871) is the official magazine of the Orthopaedic Section, APTA, Inc. Copyright 2012 by the Orthopaedic Section/APTA. Nonmember subscriptions are available for \$50 per year (4 issues). Opinions expressed by the authors are their own and do not necessarily reflect the views of the Orthopaedic Section. The editor reserves the right to edit manuscripts as necessary for publication. All requests for change of address should be directed to the La Crosse Office.

All advertisements which appear in or accompany *Orthopaedic Physical Therapy Practice* are accepted on the basis of conformation to ethical physical therapy standards, but acceptance does not imply endorsement by the Orthopaedic Section.

Orthopaedic Physical Therapy Practice is indexed by Cumulative Index to Nursing & Allied Health Literature (CINAHL).

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A Tribute to Dr. Rick Di Fabio: A Life Cut Short



Dr. Richard P. Di Fabio

1952 - 2011

Dr. Richard P. Di Fabio passed away Friday December 9th, 2011 after a prolonged and private battle with a progressive illness. He was only 59 years old, and retained his fighting spirit despite the physical challenges that marked his final years. Dr. Di Fabio, known as "Dr. D" to the students, was a faculty member at the University of Minnesota's Program in Physical Therapy for over 20 years. While at Minnesota, he was instrumental in merging an MD/PhD Program in Physiatry with an Advanced Master's degree in Physical Therapy to result in a PhD Program in Rehabilitation Science. He mentored the first graduate of that program, which has subsequently produced over 20 PhDs since its inception in 1997.

Rick was passionate about the importance of a strong educational foundation. He was a graduate of the State University of New York (SUNY) – Syracuse, with a Bachelor's degree in Physical Therapy. He received his Master's Degree in Health Education from SUNY – Cortland. He completed his PhD at the University of Iowa in 1982. He was promoted to full Professor at Minnesota in 1995. Prior to coming to Minnesota, he served as Director of the Physical Therapy Department at the University of Wisconsin Hospital in Madison.

"Dr. D" relished controversial debate

and rigorous examination of research. He enjoyed "stirring the pot" and challenging the prevailing wisdom, which contributed to his selection as a Eugene Michel's Research Forum speaker for the Research Section in 2000. He was a gifted orator and eloquent writer, as noted by his receipt of the APTA's "Golden Pen Award" for scholarly writing. He was Editor-in-Chief of the *Journal of Orthopaedic and Sports Physical Therapy* from 1999-2001, and member of the Editorial Board of the *Physical Therapy* journal from 1990-1996. He was known nationally and internationally for his research and scholarship. He was a recipient of numerous prestigious awards including the Rose Excellence in Research Award from the Orthopaedic Section, an Excellence in Research Award from the Section on Geriatrics, and the "Fesler-Lampert Chair in Aging Studies" at the University of Minnesota from 2002-2003. Over the years, his research was funded by the Minnesota Medical Foundation, National Institutes for Disability and Rehabilitation Research, and the National Institutes of Health.

Rick's research interests spanned orthopaedics, neuromotor control, aging, and outcomes research. His recent work had focused on fall risk, mobility, and rehabilitation for Supranuclear Palsy and Parkinson's disease. Dr. Di Fabio's legacy includes over

60 scientific manuscripts and editorials, 5 PhD graduates in Rehabilitation Science, numerous Master's students, and mentorship of 100s of professional physical therapy students. He had recently authored a text, *Essentials of Rehabilitation Research* that is in final editing with FA Davis. Even as his illness progressed, he continued to pursue grant funding and publish manuscripts. He had not intended to be done contributing. His intellectual pursuits will continue on through the numerous students he mentored, his published manuscripts, and his published editorials on professional issues. Rick was passionate about research and his research students, but even more so about his family--wife Betsy and two daughters, Danielle and Diana. His spirit will live on through his family.

Rick's wife, Betsy has asked that all memorial donations go to fund the Rick Di Fabio Scholarship Fund for the University of Minnesota Physical Therapy Program. The link for giving is <https://www.mmf.umn.edu/give/?webfund=239>. Please specify in memory of Rick Di Fabio for a PT student scholarship.

*On behalf of the Physical Therapy Faculty
Paula M. Ludewig, PhD, PT
The University of Minnesota*



SPRING 2012

By all accounts, the 2012 Combined Sections Meeting of the American Physical Therapy Association, held at the McCormick Convention Center in Chicago, IL from February 9th to 11th was one of the most successful ever. More than 10,933 physical therapists, physical therapists assistants, and students attended educational sessions and platform research presentations, reviewed scientific posters, and visited the exhibit hall. The Orthopaedic Section membership meeting, social reception, and awards ceremony were well attended. Several new major Orthopaedic Section initiatives were announced at the membership meeting, which are briefly described below.

NATIONAL ORTHOPAEDIC PHYSICAL THERAPY OUTCOMES DATABASE

One of the objectives in the Orthopaedic Section Strategic Plan is to develop a national orthopaedic physical therapy outcomes database. The purpose of the outcomes database is to describe orthopaedic physical therapy practice and to provide evidence of the value of orthopaedic physical therapy. As the first step in the development of the national orthopaedic physical therapy outcomes database, the Orthopaedic Section announced a 6-month pilot project to collect and analyze clinical outcomes data for patients with neck pain. The data collected during the pilot project will be based on the ICF-Based Neck Pain Clinical Practice Guidelines that were published by the Orthopaedic Section in the *Journal of Orthopaedic and Sports Physical Therapy*. More specifically, the purpose of this pilot project is to demonstrate the feasibility of collecting and analyzing outcomes data as well as the usefulness of the information to enhance clinician performance and to establish the value of orthopaedic physical therapy. The results of the pilot study will be used to plan and determine the resources needed for an electronic data capture and analysis system for the national orthopaedic physical therapy outcomes database. Ultimately, the national orthopaedic physical therapy outcomes database will be a repository for clinical and process outcomes data for the most common conditions treated by

orthopaedic physical therapists.

The pilot project to collect and analyze the outcomes of patients with neck pain that receive treatment by Orthopaedic Section members will make use of paper-based forms. Data that will be collected includes information related to episode of care (duration of care, number of visits), patient characteristics (age, sex, height, weight, comorbidities), symptoms, examination findings, treatment classification, interventions, and outcomes (Neck Disability Index, numeric pain rating). The data will be summarized to determine completeness of data collection, accuracy of the treatment classification, adherence to evidence-based treatment guidelines, and an assessment of patient outcomes. A summary of personal results will be provided to all individuals that contribute cases to the outcomes database. Additionally, to permit comparison with peers across the country, a summary will be provided to compare an individual's results with the results of all others that submitted data to the outcomes database. All results will be reported anonymously.

Participation in this pilot project is voluntary and open to all physical therapist members of the Orthopaedic Section. Individuals wishing to participate in the pilot project should submit a registration form to the Orthopaedic Section office. The registration form includes the physical therapist's name, date of entry level degree, advanced degrees, completion of residencies and/or fellowships, specialist certification, and practice setting and address. Once the registration form is submitted, the Orthopaedic Section office will assign physical therapist and practice identification numbers that are to be included on the individual case report forms for each patient submitted to the database.

The period for collecting and reporting data for the neck pain pilot project will run from April 1st to September 30th, 2012. Data should be collected and recorded throughout the course of care provided to patients. Retrospective chart reviews of patients treated prior to the data collection period will not be eligible for inclusion in the pilot project. To protect patient confidentiality, no patient identifiers should be included on the data collection forms. Completed forms will be submitted to the Orthopaedic Section office,

where the Section staff will enter the data.

Individuals interested in participating in the pilot project should contact the Section office for information and to obtain the registration and data collection forms.

CLINICAL RESEARCH NETWORK

Another initiative announced at the Orthopaedic Section Membership Meeting is the creation of a \$300,000 grant (\$100,000 per year for 3 years) to fund the development of a Clinical Research Network. This initiative, which is also consistent with the Orthopaedic Section Strategic Plan, will link established researchers with clinicians to work collaboratively to conduct one or more clinical research projects that will contribute to the evidence base for the practice of orthopaedic physical therapy. An important component to ensure success of the Clinical Research Network is active participation of any Section member who is interested and committed to participate in the project. This will provide Section members who are interested in research, but do not have all of the resources to independently conduct a research project, with the opportunity to participate in and contribute to important clinical research to advance the practice of orthopaedic physical therapy. The involvement of multiple clinicians and practices in the Clinical Research Network will enable projects to be completed efficiently and will enhance the generalizability of the results to practicing clinicians. Once established, the Clinical Research Network can be used by other members of the Orthopaedic Section to conduct additional clinical research projects.

A call for proposals to establish a Clinical Research Network was released at the Orthopaedic Section Membership Meeting in Chicago, IL and an announcement for the request for proposals was included in the
(continued on page 61)

Paris Distinguished Service Award Lecture

Gratitude, Reflection, and Challenge

Thomas G. McPoil,
PT, PhD, FAPTA



This Paris Distinguished Service Award lecture was presented at the Combined Sections Meeting in Chicago, Illinois, on February 10, 2012.

To say that receiving this award is a tremendous honor would be an over-simplification. Having served as the Chair of the Section's Awards Committee for 7 years as well as having the privilege to review the nomination packets for those individuals who have been previous recipients of the Paris Distinguished Service Award, I think it is only natural to sit back and reflect on whether someone, such as myself, has truly done enough for the Section to be worthy of this award. Thus, it is with a sense of trepidation as well as humility that I accept this award as I stand before all of you this evening. If I were to provide an overview of the thoughts I would like to present to you this evening, it would be "gratitude, reflection, and challenge."

GRATITUDE is defined by Webster's dictionary as: "a feeling of thankful appreciation for favors or benefits received." Based on this definition, I should be the one giving an award to the Section! The opportunities I have been given to serve the Section has created so many unique opportunities for me to collaborate with some of the most exceptional and dedicated physical therapists in our profession.

I AM GRATEFUL—to members of the Orthopaedic Section who on more than one occasion have allowed me to serve them as an elected officer.

I AM GRATEFUL—to Jay Irrgang, Bob Rowe, Chris Hughes, Rob Martin, and Mark Cornwall for their time and effort in developing my nomination packet.

I AM GRATEFUL—to the previous Paris Distinguished Service Award Recipients, and others not recognized, who have done so much in their own way to establish the necessary infrastructure that has allowed the Section to be the exceptional professional organization it is today.

I AM GRATEFUL—for the vision and leadership of Dr. Stanley Paris, the namesake of this award, for all he has done and con-

tinues to do to for not only the Orthopaedic Section, but also the profession of physical therapy!

On personal note, **I AM GRATEFUL**—for my parents who always stressed to me the value of hard work and to remember to treat everyone the same as you would like to be treated.

Finally, **I AM GRATEFUL**—for the love and support of my wife, Mary Anne, and my daughters, Meredith and Molly. For 36 years, Mary Anne has accepted and supported my desire to be the best clinician, teacher, and professional I could strive to be. Even at the expense of time I could have been spending with her and our daughters. Most importantly, Mary Anne has always kept me focused on what is most significant in life, as well as to help me maintain a humble reality about any accomplishments I have achieved. Needless to say, I have been truly blessed!

Gratitude, reflection, and challenge—as I reflect on my involvement with the Section, it really started in 1990. Annette Iglarsh, then Chair of the Section's Education Committee, contacted me to see if I would present the foot component for the "Review for Advanced Orthopaedic Competencies" course. This was a 10-day course that the Section had developed to help prepare the physical therapist for the didactic content for the Orthopaedic Certified Specialist examination. Of course, this was not only a great opportunity to interact with other physical therapists but it also allowed me to learn about the Orthopaedic Section. Although I had been a member of the APTA since graduating with my certificate in physical therapy in 1973, I had only attended the Association's annual summer meetings. As I taught in the Section's review courses over the next 5 years, not only did I become more knowledgeable about the Orthopaedic Section, but I also met two of the nicest and hardest working individuals I know—Terri DeFlorian, the Section's Executive Director and Tara Fredrickson, the Section's Executive Associate. I first met Terri in 1991 when the review course was held in San Diego and I met Tara in 1995 when the review course

was held in Albuquerque. In my opinion, one of the key elements that has allowed the Section to flourish over the past two decades is the exceptional service and dedication of Terri and Tara to the Section membership!

During this 5-year period, I also worked with Nancy White and Lola Rosenbaum, who served as Chair and Vice Chair of the Education Committee. In the early 90s, the Section had started to hold "roundtable" sessions on certain topic areas at CSM to provide discussion forums for members. My good friend and colleague, Gary Hunt, initially lead these foot and ankle roundtables, but when he could no longer do them Lola asked me if I would be willing to lead the roundtable sessions. As I facilitated these roundtable sessions, it became obvious to me as well as to the other therapists who regularly attended these sessions that a more formal assembly should be created to provide education as well as to enhance the physical therapy body of knowledge in the area of the foot and ankle. A core group of individuals—including Steve Reischl, Mark Cornwall, Gary Hunt, Irene Davis, Max McCloud, Michael Mueller, Debbie Nawoczinski, and me—decided we should proceed and set-up an informal meeting of physical therapists with an interest in the foot and ankle at the 1993 CSM that was held in San Antonio. By the time we arrived in San Antonio, over 200 physical therapists had expressed interest in wanting to be a member of this foot and ankle group. Nancy White arranged for several of us to meet with the Section's Board of Directors to determine the steps required to be "officially" recognized as a Special Interest Group. We left San Antonio knowing that: (1) the Section was interested in having a Foot & Ankle Special Interest Group and (2) we needed 200 valid Section member signatures presented to the Board of Directors two months prior to the next CSM. We were confident that the first

official meeting of the Foot and Ankle Special Interest Group would occur at the 1994 CSM to be held in New Orleans. Over the next 8 months, the required signatures were obtained and we were set to meet with the Board of Directors for the official recognition in New Orleans. I clearly remember being in a room at the '94 CSM with almost 75 therapists ready to celebrate the official recognition of the Foot and Ankle Special Interest Group once I returned from meeting with the Board. However, things did not go as smoothly as we all had hoped. When I presented our petition to develop the FASIG to the Board of Directors, there was concern on the Board's part that if multiple SIGs were recognized in the next few years (we were the second SIG asking to be recognized and both the pain and performing arts SIGs were also in the process of developing) that funding required to operate the SIGs, based on the current SIG operating budget, could have placed a significant financial burden on the Section. As such, the Board decided NOT to recognize the FASIG at this CSM. Needless to say, we were all very disappointed!

All I can say is thank goodness for Dorothy Santi, the Section Treasurer at that time. Dorothy met with me before leaving New Orleans; she told me that the Board needed to revise the current SIG policies, and asked me if I would help her develop a revised policy. Of course the rest is history, working with Dorothy we were able to develop revised SIG bylaws and the FASIG held the first business meeting and programming at the 1995 CSM in Reno, NV. In retrospect, the work I did to help develop the SIG and my two terms as president were relatively "easy." The reason I say this is that I never felt out of my comfort zone with any of these activities. At the same time, I could never envision myself being on the Section's Board of Directors; they had to manage all the various constituencies and specialties that comprise the Section!

It is amazing to me how serendipitous certain events in life can be! If it was not for Tim Flynn, I doubt I would be standing before you tonight. I had been invited to San Antonio to present some foot and ankle lectures at the US Army/Baylor Physical Therapy program in September of 2002, and Tim had asked me to his home one evening for dinner. After dinner, Tim who was on the Section's Nominating Committee asked me if I would be interested in running for Vice President of the Section. After some lengthy discussion, I did say yes, but figured that I would be running against at least one other candidate who

the membership would obviously see as more qualified than me. Well I was the only person slated for Vice President, was elected, and started my first term at the 2004 CSM. Talk about being intimidated at my first meeting of the Board of Directors! But, things became easier and I greatly enjoyed the job, as Joe Godges describes it, of being a "worker bee" for two Section Presidents—Mike Cibulka and Jay Irrgang.

As I reflected on the 7 years I served the Section as Vice President, several things came to mind. There is no doubt that one of the greatest thrills came on nights such as these when as the Chair of the Awards Committee I could help the Section honor those who are exceptional teachers, clinicians, and "worker bees" for the Section! The other high point during my time on the Board was the decision to pursue the development of the Clinical Practice Guidelines. During his second term as President, Mike Cibulka wanted the Board to have a real "brainstorming" session to think about new ideas and directions for Section in future years. At the 2005 CSM in New Orleans, Mike brought the 8 Board members together for an hour session with no set agenda other than just to think about the future directions and possible initiatives for the Section. It was during that meeting that Joe Godges and Jay Irrgang started the discussion about the development of clinical practice guidelines. To be honest I am not sure anyone on the Board really knew what this would these guidelines would look like when we left New Orleans, but it was decided at our March board meeting that the Section would pursue the development of the guidelines. The first meeting of the potential leaders of the various body regions for which guidelines would be developed occurred at the 2006 CSM in San Diego. Needless to say, the meeting was quite interesting. When Joe and Jay outlined the concept of the guidelines and the fact that they would be based on the ICF enablement model rather than the Nagi disablement model used in the *Guide to Physical Therapist Practice*, there were plenty of naysayers. In fact, several individuals quietly left the meeting indicating that they thought the Section was "barking up the wrong tree." How things have changed over the past 5 years. The Section's Clinical Practice Guidelines have been a tremendous success and there is no longer any debate on the use of the ICF model. Why I believe that the development of the Clinical Practice Guidelines has been such an important milestone for the Section, is that these are the first documents developed

to guide and standardize orthopaedic physical therapist clinical practice that have been solely produced by the Section.

Some would point to the Manipulation Education Manual for Physical Therapy Professional Degree Programs, developed in 2004, as a key Section document. But, the Manipulation Education Manual was a joint effort on the part of the APTA, the Education and Orthopaedic Sections, and the AAOMPT. The Section's success in developing the Clinical Practice Guidelines has demonstrated its ability to build consensus, to possess the level of sophistication, as well as the credibility to develop professional policy independently on a national level.

The **CHALLENGES**—I would like to put forth for the membership and the Board to consider this evening is related to education, both postprofessional and entry-level. During my time as Vice President, I was very fortunate to have served as Board Liaison to all of the educational components of the Section.

As Jan Richardson noted in her Paris Award Lecture in 2009, the Orthopaedic Section was "first developed with the intent of promoting manual therapy in our profession." She further noted that as it grew, the Section's vision of orthopaedics expanded from just manual therapy to a broader spectrum of musculoskeletal care across the life span. Nowhere is this growth of the Section's mission to enhance the continuum of musculoskeletal care more evident than in the various topics offered through the Independent Study Course series. Initiated by the Section in 1991, the topics of the Independent Study Courses have ranged from Orthopaedic Implications for the Patient with Diabetes, Dance Medicine, Movement Disorders and Neuromuscular Interventions for the Trunk and Extremities, to the "classic" Current Concepts of Orthopaedic Physical Therapy. The reason the Independent Study Course series has flourished, over the past 21 years, is not only because of the dedicated Editors and exceptional authors, but because physical therapists, members and nonmembers alike, who recognize that the Section will always produce the most professional, evidence-based, quality information at a fair price. They "trust" the Section knowing that the mission of the Section is to serve the membership! And the Independent Study Course Series has indeed flourished! For the past several years, the profits from the ISCs have been as high as 15% of the Section's total income. Thus, it is critical that the Section ensure that the ISCs

continue to be a professional, cost-effective, value-priced, and user-friendly source for continuing education. From its inception, the ISCs have been provided to subscribers via hard paper copies. And, it is important to realize that many subscribers indicate that one of the reasons they like the ISCs is that they prefer to have the paper copies. But, I firmly believe that if the ISC series is going to continue to be successful with the next generation of physical therapists, the Section must pursue and implement alternative methods of providing these courses to subscribers via the World Wide Web. While this will require an investment by the Section to initiate these changes, we must make sure that the Independent Home Study Course series remains *the* first choice for members and nonmembers seeking the highest quality postprofessional continuing education with the access that fits their lifestyle!

The **LAST CHALLENGE** I would like to present to the membership is related to “entry-level” education. I think the time has come for the Orthopaedic Section to take the lead in developing an entry-level “Orthopaedic” Education Manual, similar to the Manipulation Education Manual, but as the title infers, providing at the very least an integrated model of an orthopaedic physical therapy examination and evaluation of the upper quarter, lower quarter, and spinal disorders based on best-available evidence that complements current entry-level curricula in therapeutic exercise, physical agents, and differential diagnosis. I would love to be able to tell my entry-level students that the musculoskeletal conditions we are discussing and that the orthopaedic tests & measures that they are learning are the same ones being taught to all entry-level students throughout the United States based on best current evidence and clinical usefulness. In talking to my colleagues who are full-time clinicians, some of who are involved with orthopaedic residency programs, they lament at the amount of time they must spend reviewing with new graduates what they consider to be “entry-level” examination and evaluation competencies. Of course, there lies the issue; the clinicians are determining what is “entry-level” based on their individual professional and clinical experience! As orthopaedic physical therapy educators, and we are all educators irrespective of our “practice” setting, we must establish standardized “entry-level” examination and evaluation educational competencies. By no means is this a new idea. Bob Rowe, while serving as Chair of the Practice Committee, brought

this same proposal to the Board several years ago, but at the time it seemed too daunting of a task. In reviewing the literature, there have been a few attempts to survey clinical and academic physical therapists regarding curricular content in joint manipulation, as well as electrophysical agents. There have also been published recommendations for entry-level curricula for Women’s Health as well as for the preparation of physical therapy diagnosticians. Some would argue that this “project” should *not* be undertaken by a national body, such as the Section, since gaining consensus among clinical and academic worlds can often slow the effort and create frustration. But, the ultimate success of this type of “project” is the “buy-in” on the part of the entire clinical and academic physical therapy community of the final product. I firmly believe that the Section is the national body that can not only successfully lead this effort, but also ensure its suc-

cess. As I previously noted, the Section has proved it has the ability to build consensus, provide the leadership, as well as the credibility to develop this type of policy document based on the success of the Clinical Practice Guidelines. I sincerely hope that the Section will consider making the development of an Orthopaedic Education Manual a strategic priority so our *future* entry-level students will be prepared to provide a unified, consistent, and evidenced-based approach when performing an orthopaedic examination and evaluation of their patients.

In **CLOSING**, I would like to again thank the Section’s Board of Directors and the Awards Committee for this recognition and the opportunity to share my thoughts with you. I am proud to be a small part of the Section’s history and will be forever grateful for this honor.

Thank you!

PRESIDENT’S CORNER

(continued from page 58)

March Osteo-BLAST. Application for the Clinical Research Network grant is a multi-step process. The first step in the application process for the Clinical Research Network grant is the submission of a short pre-proposal that details the specific aims, significance, impact, and research strategy for the project. The pre-proposals are due May 1, 2012. The top ranked proposals will be invited to submit full proposals, which will be due August 1, 2012. Upon review of the full proposals, the top proposal will be recommended for funding and a collaborative agreement to establish the Clinical Research Network, with clearly defined milestones for continued funding will be established between the investigators and the Section. To support and assure success of the Clinical Research Network, a Steering Committee will be established to provide oversight and guidance for the investigators to ensure that the study milestones are achieved and the Section funds are used efficiently.

FIRST ANNUAL ORTHOPAEDIC SECTION MEETING

The first annual Orthopaedic Section Meeting, to be held in Orlando FL, May 2nd to 4th, 2013, was also announced at

the Orthopaedic Section Membership Meeting in Chicago, IL. This 2-day meeting will provide a combination of didactic sessions with multiple concurrent laboratory sessions designed to enhance clinical reasoning and psychomotor skills. The program will feature several keynote lectures by nationally and internationally recognized leaders in orthopaedic physical therapy. There will also be plenty of opportunities to network with your peers. Please watch your E-mail inbox for Osteo-BLAST regarding future announcements regarding the location and program details.

As you can see, the Orthopaedic Section leadership and staff have been very active with these new initiatives that we hope you will find will add value to your membership in the Orthopaedic Section. As always, if you have any questions regarding this information or suggestions to improve the services provided by the Orthopaedic Section, please contact me (jirrgang@pitt.edu or 412-605-3328) or Terri DeFlorian at the Orthopaedic Section office (tdeflorian@orthoapt.org or 800-444-3982 ext 204).

Best wishes for a happy and safe spring.

Ergonomic Exposure Assessment Methods for Identifying Musculoskeletal Disorder Risk in the Workplace: An Example from the Grocery Industry

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ABSTRACT

Background and Purpose: Work-related musculoskeletal disorders (WRMSDs) are common in industry. Physical risk factors are associated with WRMSDs, and ergonomics programs are effective in reducing exposure to these factors. The purpose of this paper is to describe the exposure assessment methods used in an ongoing ergonomics study of the grocery industry and provide practical suggestions for physical therapists who wish to function as ergonomic consultants to industry. Four ergonomic exposure assessment methods used in the grocery ergonomics study are described. **Clinical Relevance:** The ergonomic exposure assessment methods described in this paper may be used by physical therapists to evaluate risk factors associated with WRMSDs. Exposure assessment methods are readily available through online resources and may be used by clinicians to perform ergonomic consultation.

Key Words: occupational, participatory ergonomics, grocery, exposure assessment methods

INTRODUCTION

Work-related musculoskeletal disorders (WRMSDs) are prevalent throughout all sectors of the workforce and hinder the ability of workers to perform job-related tasks.¹⁻³ The economic impact that WRMSDs have on industry is large; WRMSDs account for the highest percentage of compensation and disability cases among workers.⁴ Additionally, WRMSDs result in lost productive time due to days away from work.⁵ In 2010, the Bureau of Labor Statistics estimated that 40% of all nonfatal occupational injuries and illnesses that resulted in days away from work were due to sprains, strains, or tears.⁶

The grocery industry is no exception. For example, the incidence rate of sprains and strains among grocery workers was 65.7 per 10,000 full time workers compared to 48.3 for the retail industry in general.⁷

It is well established that exposure to physical risk factors is associated with WRMSDs.^{4,8} Common risk factors found in grocery stores include forceful and repetitive exertions of the hand, heavy lifting, and awkward or sustained postures.⁹⁻¹² Specific examples include repetitive scanning of items by cashiers, lifting heavy boxes by meat cutters, and frequent trunk forward bending by bakers.

The risk of musculoskeletal injury inherent in a particular work task can be estimated by assessing exposure to risk factors in that task. Many exposure assessment methods are available for physical therapists to use in any industry where they provide ergonomic consultative services. The purpose of this paper is to describe the exposure assessment methods used in a study of participatory ergonomics in the grocery industry.

PROJECT DESIGN

The primary goal of the ongoing ergonomics study is to evaluate the effectiveness of a participatory ergonomics (PE) program for the grocery industry. Participatory ergonomics is a process where management and employees receive education in ergonomics and WRMSD risk management. They can then work together to identify risk factors, brainstorm to come up with solutions to mitigate the factors, and implement these changes to reduce the risk of WRMSDs.^{13,14} To date, no studies have examined the effectiveness of participatory ergonomics programs within grocery stores.

The project methods were based on the

“Ergonomics Process” consisting of 5 steps: (1) identification, (2) analysis, (3) solution development, (4) solution implementation, and (5) re-evaluation.^{14,15} In the initial phase of the study, we administered Step 1 of the Ergonomics Process and surveyed grocery workers about musculoskeletal symptoms they felt were work-related using the Modified Nordic Survey.¹⁶ Additionally, we identified physical risk factors in the grocery store and analyzed them (Step 2) using the ergonomic exposure assessment methods described below.

After implementing these baseline steps, we implemented an ergonomic training intervention for the store's safety committee members. This 6-hour training emphasized committee implementation of the Ergonomics Process into current systems using a problem-solving approach. Topics of the training included the goals of ergonomics; common work-related MSDs among grocery workers; modifiable work factors; workplace risk factors; basic methods of ergonomic exposure assessment; ergonomic job analysis of grocery tasks; ergonomic process implementation; hierarchy of controls (ergonomic solutions); and the development, implementation, and evaluation of solutions. The training was customized for the participating grocery stores by using video clips of their workers performing tasks. A PowerPoint version of this training will be available at the Washington State Department of Labor & Industries Web site at the conclusion of the study.

ERGONOMIC EXPOSURE ASSESSMENT

As mentioned, Step 2 of the Ergonomics Process is analysis of the worksite, also called “exposure assessment.” There are 3 types of

exposure assessment methods commonly used by ergonomic consultants: self-report, observational, and direct measurement.¹⁷ Self-report methods require the worker to estimate exposure to risk factors, such as rating perceived exertion (RPE) with the Borg scale.¹⁸ These methods have the potential for bias since the respondent can over- or under-report workplace exposure. In contrast, exposure can be directly measured with instrumentation, such as surface electromyography for estimating forceful exertions or electrogoniometry for measuring awkward wrist postures. Although more accurate than self-report, direct measurement is costly and limited to assessing a minimum number of anatomical sites.

Observational exposure assessment methods are a compromise between the simplicity and ease of use of self-report methods, and the precision of direct exposure assessment.¹⁹ Observational analysis methods are being used in the current study to allow for simple, noninvasive, and efficient exposure assessment while grocery workers perform work tasks in their natural work environment.

Tasks were selected for observational analysis based on worker reports of fatigue while performing tasks, and/or observation of potentially hazardous tasks during the investigators' initial store walk-through. Particular tasks were measured and included stocking of large items by the freight crew, bread making, meat cutting, stocking milk, and cashiering, among others. Each task was filmed for 10 to 30 minutes depending on the assessment method used for the task. To ensure accurate representation of the task, two video cameras were placed on tripods at approximately 90° angles to each other. For tasks requiring manual material handling, a tape measure and scale were used to measure distances and weights, respectively. When possible, investigators were not present in the work area during filming in an attempt to minimize the Hawthorne Effect,²⁰ ie, workers modify how they do a task if observed.

After data was collected, exposure to physical risk factors was assessed in the Biomechanics and Ergonomics Laboratory at Eastern Washington University using 4 methods: Rodgers Muscle Fatigue Analysis, Hand Activity Level, Ovako Working Posture Analyzing System, and Utah Back Compressive Force Scale. These methods were selected because they efficiently and accurately assess exposure. Additionally,

these methods are easy to learn for those without formal training in ergonomics, ie, safety committee members. Finally, the techniques are versatile and can be used by physical therapists to assess exposure at virtually any worksite.

Rodgers Muscle Fatigue Analysis

The Rodgers Muscle Fatigue Analysis is being used in the current study to prioritize grocery work tasks in terms of their ability to cause musculoskeletal fatigue.²¹ The primary construct of the Rodgers Analysis is that musculoskeletal fatigue could lead to a WRMSD. This method assesses the 3 variables associated with any physical risk factor: effort level, frequency, and duration. Effort level estimates worker exertion based on body posture, load lifted, and/or force exerted. Effort frequency is assigned by recording the number of times the worker performs the exertion per minute. Duration measures the length of time for a single exertion in seconds. The combination of effort level, frequency, and duration determine the risk of fatigue, ie, injury potential, for the task being assessed. Specific anatomical regions, for example, the neck, shoulders, or back, are assessed separately.

The outcome of the Rodgers Muscle Fatigue Analysis is a 'priority for change' score, categorized as low, moderate, high, or very high. The physical therapist can use this score to prioritize which tasks to modify first, as well as which variable (effort, duration, and/or frequency) should be modified to reduce the risk of injury. In an example from the study, the task of stocking milk (Figure 1) earned a high priority for change score of 313 at the shoulder. This score indicated the worker was "exerting forces or holding weight with arms away from body or overhead" for less than 6 seconds at a time but repeating this effort 5 to 15 times per minute.

Since effort contributed the most to potential musculoskeletal fatigue in the previous example, potential ergonomic solutions could include lowering milk shelves to below shoulder height and incorporating shelf sliders so the milk could roll into position rather than being pushed forward by the worker. The frequency score could be reduced by lifting milk containers with alternate hands or interspersing the stocking task with other tasks. In participatory ergonomics programs, the safety committee is often charged with developing potential solutions for reducing exposure to risk factors (Step 3



Figure 1. Example of task assessed with the Rodgers Muscle Fatigue Analysis. Primary physical risk factors of stocking milk are repetitive exertions and awkward shoulder postures.

of the Ergonomics Process), although outside experts such as physical therapists may assist with this step.

Hand Activity Level

Certain tasks in the grocery industry, such as cashiering and meat cutting, are considered highly repetitive for the hand. To assess this risk factor, the Hand Activity Level (HAL) measure was used.²² The HAL is a 0 to 10 point scale that estimates both hand "pauses" or rest periods and hand "busyness" or speed of hand movement. Higher HAL ratings are associated with WRMSDs of the distal upper extremity, such as carpal tunnel syndrome.²³ This assessment method has been used in a variety of industries including automotive, manufacturing, and health care.²⁴⁻²⁸ Additionally, the HAL is one of only 3 ergonomic exposure assessment methods that has a Threshold Limit Value (TLV),²⁹ the level of exposure that minimizes potential for musculoskeletal injury. In the current study, the mean HAL score for meat cutting (Figure 2) was 8 for some workers, which is considered high repetition.

Ovako Working Posture Analyzing System

To assess awkward postures during grocery tasks, the Ovako Working Posture Ana-



Figure 2. Meat cutting assessed with the Hand Activity Level.

Table 1. Description of the OWAS Scoring Method

Anatomical Region	Description	OWAS Score*
Back	Straight	1
	Bent forward	2
	Twisted or bent sideways	3
	Bent and twisted	4
Shoulders/Arms	Both arms below shoulder level	1
	One arm at or above shoulder level	2
	Both arms at or above shoulder level	3
Legs	Sitting	1
	Standing with both legs straight	2
	Standing with one leg straight	3
	Standing or squatting with both knees bent	4
	Standing or squatting with one knee bent	5
	Kneeling on one or both knees	6
	Walking or moving	7
Load Weight	< 10 kg	1
	10 -20 kg	2
	> 20 kg	3

*Higher OWAS scores do not necessarily indicate higher exposure.

lyzing System (OWAS) was used.^{30,31} This “work sampling” method requires the physical therapist to make numerous observations of low back, shoulder, and lower extremity posture, and enter a number related to each posture category (Table 1) into a computer program (WinOWAS, Tampere University of Technology, Finland). The load handled by the worker is similarly entered. Samples are taken at a repeated time interval for a set

duration; in the current study, samples were taken every 15 seconds for 30 minutes. The OWAS method can be used in real time by using a laptop computer or by watching a video recording of the task.

When all samples are collected, the computer program calculates the percentage of time the worker spends in each posture category. The task is then placed into an “action category” (AC), reflecting the risk level for

developing WRMSDs. The first action category, AC 1, is considered a normal posture, while ACs 2 through 4 are classified as harmful postures. The OWAS method is especially beneficial for analyzing tasks without a set work cycle, such as the freight tasks in the current study. Grocery freight workers spend hours unloading boxes off pallets, stacking items onto low and high grocery store shelves, and moving heavy pallet jacks down aisles in order to stock items. As a result of this repetitive manual material handling, OWAS placed freight tasks into one of the harmful AC categories.

Utah Back Compressive Force Scale

The Utah Back Compressive Force Scale (UBCF) is being employed in the current study to estimate spinal compression at the L5-S1 joint.³² When using this tool, the physical therapist weighs the object to be lifted with a scale, measures the horizontal distance from the object to the L5-S1 motion segment with a tape measure in real time, and estimates the worker’s maximal lumbar flexion angle during the task. These values and the worker’s body weight are used to estimate the compressive force on the spine. If the compressive force of the task is greater than a benchmark of 3.4 kN (770 lb), the task is considered hazardous and could lead to injury.³³ Due to the approximation method of the UBCF Scale and the potential for measurement error, a slightly lower benchmark of 700 lb is suggested for the force limit.

We are using the UBCF to estimate spinal compressive forces while stocking 16 kg dog food bags (Figure 3, Table 2). As indicated in Table 2, the estimated compressive force of 1,136 lb was well over the acceptable 700 lb value. The load and moment contributed the most to the compression. Therefore, these variables should be considered for change first when modifying the task. Potential solutions include using a lift team when handling heavier objects, use of pallet jacks with a scissors lift to maintain lifting between knee and waist height (Figure 4), or modifying the height of the store shelves.

DISCUSSION

After task identification and exposure assessment, the next few steps in the Ergonomics Process are solution development and implementation, followed by re-evaluation of the newly designed tasks. Thus, the Ergonomics Process works in a circular fashion, allowing for continued ergonomic



Figure 3. Stocking dog food assessed with the Utah Back Compressive Force Scale. Since the physical risk factors are heavy lifting and awkward back postures, the Rodgers Muscle Fatigue Analysis and OWAS could also be used.

Table 2. UBCF Scale Results for Lifting Dog Food Task

Measure	Value
Body weight (lb)	175
Load (eg, weight of dog food bag; lb)	44
Horizontal distance from hands to L5-S1 joint (in)	23
Back posture angle from vertical (degrees)	90
Contributing Factors*	Value
A. Back posture	525
B. Load moment with dog food bag lift	506
C. Compression from dog food bag and upper body weight	105
Estimated compressive force (A+B+C; lb)	1,136
* Equations for contributing factors are as follows: $A=3 \text{ (Body weight)} \times [\sin \text{ (Back posture angle from vertical)}]$ $B=0.5 \text{ (Load)} \times \text{(Horizontal distance from hands to L5-S1)}$ $C=0.8 \text{ [(Body weight)/2 + Load]}$	

improvement in the workplace.³⁴

In the current ergonomics study, grocery workers have been eager to develop ergonomic solutions. For example, a worker from the meat department recognized that grinding meat into hamburger was stressful on his back. The position of the grinder required him to stand in a forward flexed static posture for long periods of time (Figure 5). Since raising the height of the grinder was not possible, his simple solution was to sit on a milk crate while grinding the meat. Inexpensive solutions such as this are common for many ergonomic interven-

tions.^{14,35} Regardless, successful participatory ergonomics programs involve both workers and management in solution development. The ergonomic consultant guides the process but is not the primary individual recommending solutions.

In the current study, multiple assessment methods were used to analyze one task if that task demonstrated several physical risk factors. For example, cashiers are not only exposed to highly repetitive actions of the hand but also experience static postures of the neck. Therefore, the HAL and Rodgers Muscle Fatigue Analysis were used. It is at



Figure 4. Scissors lifts pallet jacks are an example of an ergonomic solution that could maintain lifting between knee and waist height.



Figure 5. Grinding hamburger in a prolonged trunk flexion posture.

the discretion of the physical therapist to determine which assessment methods are appropriate for analyzing a task.

Physical therapists must have an adequate understanding of exposure assessment methods to function as independent ergonomic consultants. The Web site for the American Physical Therapy Association's Occupational Health Guidelines³⁶ and the *Guide to Physical Therapist Practice*³⁷ are useful resources to begin exploring the role of ergonomics in physical therapy. Continuing education courses, either online or in-person, are another way to learn about occupational health topics. Also, visiting a patient's worksite is an excellent way to gain experience in ergonomics. Finally, online resources are available describing various exposure assessment methods. A comprehensive site of these methods has been compiled by Dr. Thomas Bernard, Department of Occupational and Environmental Health, University of South Florida.³⁸ This Web site contains a description and instructions for each exposure assessment method, helpful for physical therapists deciding which exposure assessment to use when analyzing a certain task.

Physical therapists are trained to be experts in movement science and musculoskeletal injuries. As ergonomic consultants,

physical therapists can expand their role in health care and help minimize the tremendous economic impact that WRMSDs have across all sectors of industry.

ACKNOWLEDGEMENTS

This project was funded by Washington State Department of Labor & Industries Safety and Health Investments Project (SHIP) Grant 2008XH00097. We appreciate the technical assistance of Christine Olsen, SPT, and Blake Novoa, SPT. The authors give special thanks to the grocery workers and stores that are participating in this project.

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Osteoporosis Identification and Management for the Physical Therapist

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ABSTRACT

Background: Osteoporosis is a prevalent skeletal disease affecting 52 million Americans. With appropriate care, osteoporosis, fractures, and resultant disability can be prevented. The condition is also easily diagnosed and treated; however, many patients are failing to be identified or managed, even after sustaining a fragility fracture or a fracture from a force that is usually not great enough to cause broken bones. The National Osteoporosis Foundation (NOF) has put forth clinical practice guidelines for prevention and management of the condition, yet these guidelines remain under-used and while comprehensive do not clearly guide clinical decision making for the average busy clinician. As a result, osteoporosis-related fractures are associated with direct medical costs of over \$17 billion a year and are expected to soar to \$25 billion in 2025. Physical therapists are in a key position to identify at-risk patients and lower the burden of disease, yet minimal literature exists for these health professionals. **Purpose:** The aim of this project is to give clinicians and colleagues a decision-making algorithm and the tools necessary to effectively identify and manage osteoporosis. **Methods:** The most current evidence on osteoporosis management was gleaned from an extensive literature review of approximately 40 sources, the majority of which are peer reviewed articles. **Findings:** Based on current evidence, a clinical decision-making algorithm was developed to guide physical therapist's care for patients with or at-risk for osteoporosis. In addition to the algorithm, a written manuscript was completed discussing the severity of the health problem, explaining the algorithm, and exploring diagnosis, prevention, and treatment of osteoporosis pertaining to physical therapists. The clinical algorithm uses fall risk factors, clinical risk factors, the fracture risk assessment tool (FRAX®), and bone mineral density (BMD) to categorize patients into risk categories ranging from minimal to severe risk. Based on a patient's

risk category, recommendations are made for lifestyle changes, prevention, and/or treatment of osteoporosis and related deficits. **Clinical Relevance:** The proposed algorithm presented in this manuscript provides clinicians with comprehensive, yet simple tools to use in practice in efforts to reduce the global burden osteoporosis and associated fractures impose on the individual and society.

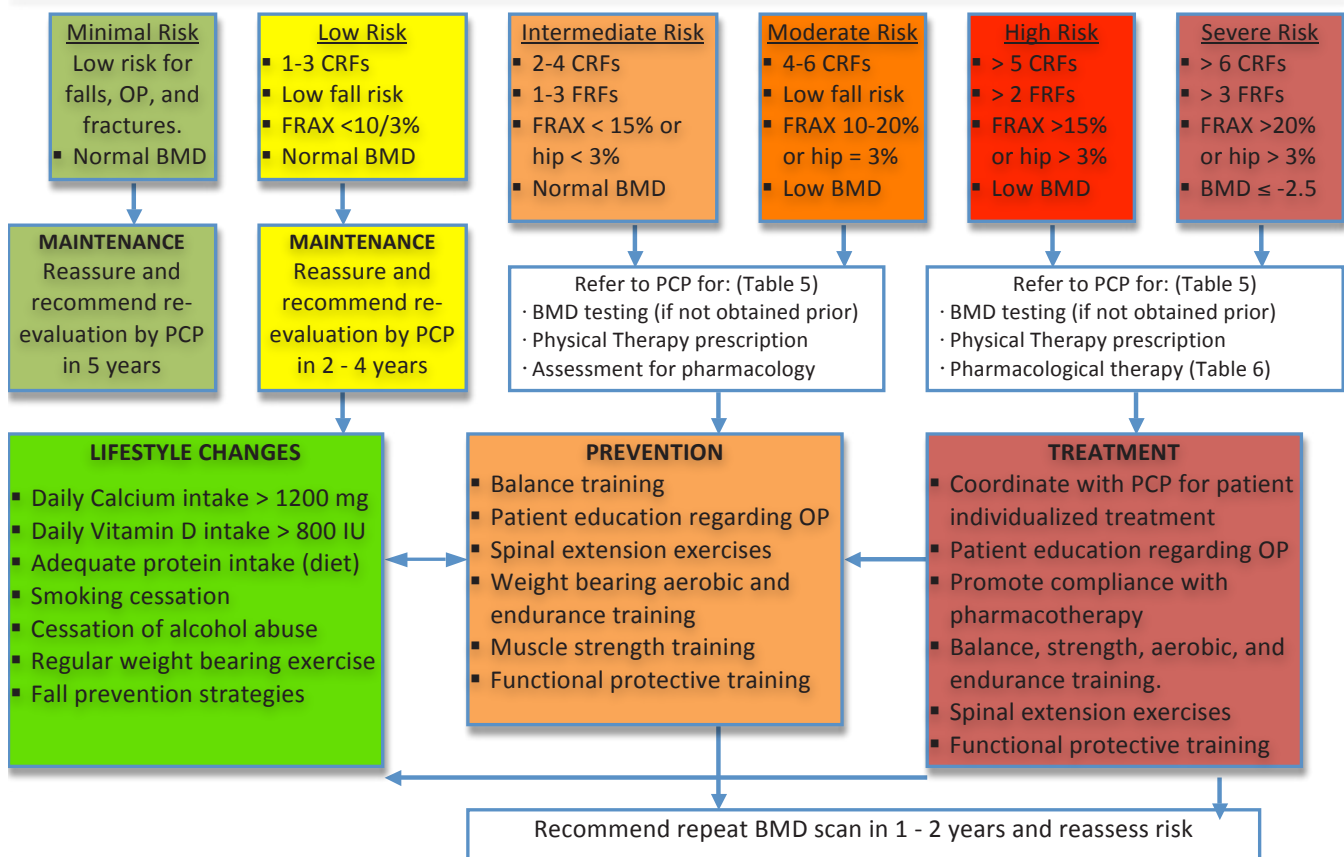
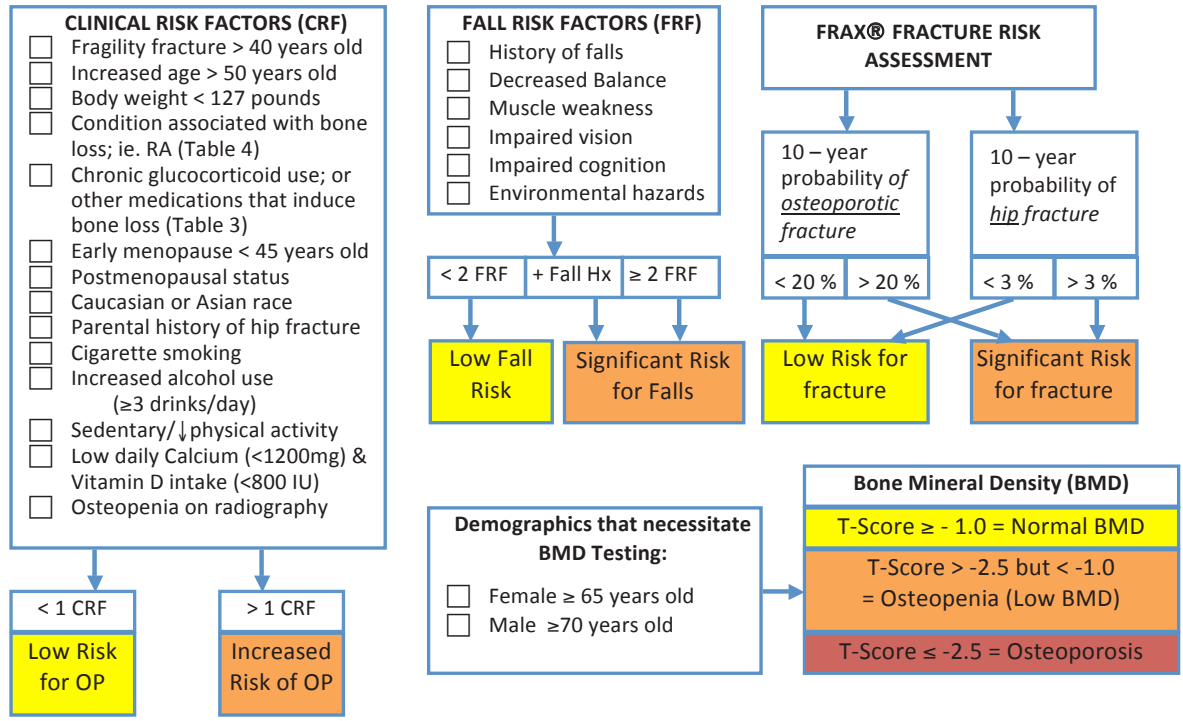
Key Words: osteoporosis, physical therapy, clinical practice guidelines, algorithm

INTRODUCTION

Osteoporosis is a common and silent disease characterized by low bone mass and structural deterioration of bone tissue, leading to bone fragility and increased fracture risk. The condition is a major health threat to 52 million Americans. More than 10 million adults in the United States have osteoporosis, 80% of which are women, but almost 3 million males are affected as well.¹ Remarkable advances in osteoporosis research in recent decades, like the development of FRAX®, the fracture risk assessment tool, has led to an increased ability for health professionals to prevent, assess risk factors, diagnose, and treat bone disease. However, osteoporosis is still greatly underdiagnosed and undertreated despite available screening tools and effective treatments such as pharmacological intervention and physical therapy. Several studies have shown a high rate of failure in detecting and treating osteoporosis, even in elderly patients who have sustained low-impact fractures.² The consequences of this discrepancy between under-used effective screening and the clinical realities of care has resulted in high medical and financial costs. Fragility fractures due to osteoporosis or low bone density (osteopenia), precipitate excess mortality, disability, chronic pain, more than 432,000 hospital admissions, almost 2.5 million medical office visits, and about 180,000 nursing home admissions per year. The estimated economic impact of osteo-

porosis-related fractures is startling: \$17 billion in health care costs in 2005--with hip fractures making up 72% of the cost. Large personal costs are also associated with osteoporotic fractures; 24% of hip fracture patients age 50 and older die in the year following fracture, and almost all patients are burdened with pain, physical limitations, and psychological symptoms.¹ The prevalence of osteoporotic fractures is greater than breast cancer, stroke, heart failure, and myocardial infarction combined; and with the aging population, the Surgeon General estimates that the number of hip fractures and their associated costs could double or triple by the year 2040.³

Fortunately, the prognosis for patients with osteoporosis is good if identified and treated in a timely manner.² However, barriers exist to initiating treatment of low bone density and osteoporosis; including a lack of knowledge and understanding by the patient and the clinician, a lack of awareness and use of current osteoporosis guidelines, the cost of therapy, the time and cost of diagnosing osteoporosis, confusion about medications available for osteoporosis and their effectiveness, patient reluctance to seek diagnosis, noncompliance to treatment, and a lack of the time required to address secondary prevention.⁴ Also, many of the risk assessment tools are complex and difficult for health care providers to implement because of time restrictions in daily practice, or these tools are targeted for use by specialists. Hence, there is a need for improved access to simple and easy-to-use risk assessment tools for clinicians, especially physical therapists who have a potentially large role in the care of patients at-risk for osteoporosis and related fractures. Historically, physical therapists are typically only involved in the rehabilitation of osteoporotic patients post-fracture. However, physical therapists are in a prime position to identify at-risk patients before fracture. The clinical decision-making algorithm presented is designed to fill this need (Figure 1).



*DISCLAIMER: THIS ALGORITHM IS INTENDED TO BE A GUIDE, NOT A MANDATE FOR MANAGING PATIENTS. THE DECISION TO TREAT, NOT TREAT, OR REFER SHOULD BE BASED ON CLINICAL CONSIDERATIONS FOR EACH INDIVIDUALIZED PATIENT.

Figure 1. Clinical decision-making algorithm.

IDENTIFYING AT-RISK PATIENTS

Less than 40% of patients with osteoporosis receive appropriate therapy.⁵ Efforts must be made to increase that number by improving the identification of at-risk patients, so more patients can be managed properly. The objective of this article is to provide clinicians with an easy to use, multifaceted tool that identifies patients who are at-risk for osteoporosis and fracture. Furthermore this tool will assist in patient management.

Diagnosis of osteoporosis defined in terms of bone mineral density (BMD) using dual x-ray absorptiometry (DXA) consists of a T-score ≤ -2.5 standard deviation (SD) below the young sex-matched mean as established by the World Health Organization (WHO). However, the International Society for Clinical Densitometry (ISCD) states that diagnosis of osteoporosis with DXA only applies to postmenopausal women and men age 50 or older.⁶ The most validated BMD test site for osteoporosis diagnosis is the femoral neck; however, the lumbar spine, total hip, and distal 1/3 radius are also used.^{7,8} Osteoporosis can also be diagnosed without BMD in the presence of a fragility fracture – a fracture occurring with minimal trauma or force from standing height or less.³ Other diagnostic classifications by BMD are listed below:

- Normal BMD (a T-score of -1.0 or above)
- Low bone density or osteopenia (a T-score between -1.0 and -2.5)
- Osteoporosis (a T-score at or below -2.5)
- Severe osteoporosis (a T-score at or below -2.5 , with a fragility fracture)⁸

Indications for BMD testing are listed in Table 1 and many mirror the clinical risk factors for osteoporosis. Although physical therapists themselves may not be able to order BMD testing, a DXA can be recommended to the primary care physician (PCP) with the use of the *Osteoporosis Care Coordination Request* form (Appendix 1). This proposed form was developed by the authors in order to provide a practical resource that therapists can use clinically when communicating with physicians. A patient's specific clinical and fall risk factors, FRAX[®] data, overall physical therapist risk assessment along with appropriate requests for the PCP are included in a simple to complete and easy to understand format.

Studies have shown the inverse relationship between bone mass and fracture; for

Table 1. Indications for Bone Mineral Density (BMD) Testing⁶

- Women aged 65 and older.
- Postmenopausal women under age 65 with risk factors for fracture.
- Women during the menopausal transition with clinical risk factors for fracture, such as low body weight, prior fracture, or high-risk medication use.
- Men aged 70 and older.
- Men under age 70 with clinical risk factors for fracture.
- Adults with a fragility fracture.
- Adults with a disease or condition associated with low bone mass or bone loss.
- Adults taking medications associated with low bone mass or bone loss.
- Anyone being considered for pharmacologic therapy.
- Anyone being treated, to monitor treatment effect.
- Anyone not receiving therapy in whom evidence of bone loss would lead to treatment.

instance, with each SD decrease in BMD, the risk of fracture increases 1.5 – threefold. More importantly, the majority of fractures occur in women not diagnosed with osteoporosis, but with BMD in the osteopenic range (T-score between -1.0 and -2.5). Consequently, BMD can identify those at high risk, but alone cannot reliably predict who will fracture and who will not.⁷ Therefore, BMD is just one factor in the overall fracture risk assessment, and more weight can be given to those independent risk factors for fracture that are discussed in the following section.

Osteoporosis screening tools and even algorithms are already available for clinicians; however, most tools target PCPs or are incomplete in their risk assessment. For example, the osteoporosis management algorithm published by Hamdy et al³ uses only DXA as its main determinant for treatment, consequently missing all those who are not diagnostically osteoporotic, but may very well be at risk for falls or fractures. The algorithm also does not account for all clinical risk factors, such as decreased physical activity and low body weight, and fails to include any risk factors for falls. The FRAX is a fairly recent development from the WHO that incorporates the weight of certain clinical risk factors with or without BMD information and computes the 10-year probability of major osteoporotic fracture and/or hip fracture. The tool is based on a series of meta-analyses using data from 9 population based cohorts from around the world including North America, Europe, Asia, and Australia.⁹ This free, web-based computer program is simple to use and accessible, especially when compared to DXA scanning. Although FRAX is a significant improvement in fracture risk assessment, the tool has some limitations. These limitations include the under- and over-reporting of

some risk factors, and the complete absence of factors such as low vitamin D intake or frequent falls. There is no dose/response correction for multiple fractures, excessive alcohol use, or high cumulative corticosteroid exposure. What regression parameters are used, or how FRAX was developed remains unknown. Interestingly, FRAX was found to predict hip fracture better in women with normal and low BMD than in those with osteoporosis.¹⁰ For that reason, and because NOF guidelines state that treatment should be initiated for men and women with a FRAX 10-year hip fracture probability of $\geq 3\%$ or a 10-year major osteoporotic fracture probability $\geq 20\%$, FRAX is included as one part of the algorithm discussed in this article. The absolute 10-year hip fracture probability of 3% has been proven to be the intervention threshold of when osteoporosis treatment is cost-effective as concluded from model-based cost-effectiveness analyses.^{1,11} With the growing elderly population and increasingly fiscally strained health care budget, cost-effective osteoporosis screening and intervention need to become common practice. The fracture risk assessment tool does provide physical therapists with more information on which to base their clinical judgment. However, in addition to all of the above-mentioned limitations, it is important to note that FRAX may not work as well for men and it is only designed to assess people between 40 and 90 years of age.¹⁰

The literature offers no clear answer for how to manage individuals at low or moderate risk for osteoporosis; nor has research agreed on the single best screening tool. Our proposed algorithm for physical therapists uses a combination of FRAX and BMD measurements, clinical and fall risk factors to give a comprehensive risk assessment, which may improve sensitivity and specificity over using any one screening tool alone.¹²

Table 2. Clinical Risk Factors for Low Bone Mass and Osteoporosis^{1,3}

Nonmodifiable	Modifiable
Female gender	Low body weight < 127 lbs.
Age > 50 years	Low physical activity
Caucasian or Asian race	Low calcium intake (<1200 mg/day)
Postmenopausal status	Low vitamin D intake (<800 IU/day)
History of fragility fracture	Alcohol abuse > 3 drinks/day
Conditions associated with bone loss *	Glucocorticoid, medication use **
Positive family history	

* See Table 4 for full list of conditions associated with bone loss.
** See Table 3 for full list of medications associated with bone loss.

Table 3. Medications Associated with Low Bone Mass^{1,3}

Aluminum-containing antacids	Androgen deprivation therapy
Anticonvulsants	Aromatase inhibitors
Barbiturates	Cancer chemotherapeutic drugs
Cyclosporine	Cytotoxic drugs
Depo-medroxyprogesterone (Depo-Provera)	Doses of thyroid hormone
Excessive doses of vitamin A	Exchange resins
Glucocorticoids	Gonadotropin-releasing hormone agonists
(≥ 5mg/d of prednisone or equivalent for ≥ 3 mo)	Lithium
Long-term heparin	Progesterone
Proton pump inhibitors	Selective serotonin-reuptake inhibitors
Thiazolidinediones	

A comprehensive approach to detect patients in need of further screening or treatment for osteoporosis includes many routine aspects of clinical examination performed by physical therapists. A detailed history, screening for specific clinical risk factors, a physical examination, combined with results from FRAX and BMD constitutes a thorough evaluation. Why are physical therapists not the principal identifiers of patients at-risk?¹⁰ Therapists have the tools, knowledge-base, and skills needed to identify these patients, and therefore have the ability to prevent future fractures and disability with proper management of these screened patients. The proposed algorithm and associated forms are designed to enable therapists to close the gap between available tools and implementation of care in order to reduce the burden osteoporosis inflicts on the individual and society.

Many clinical risk factors are associated with low bone mass or osteoporosis as shown in the clinical decision making algorithm and listed in Table 2. Certain risk factors contribute to risk independent of BMD, for example increased age.⁹ The NOF recommends that all postmenopausal women and men age 50 and older should be evaluated clinically for osteoporosis risk in order to determine the need for BMD testing. In general, the more risk factors that are present, the greater the risk of fracture.¹ The algorithm proposed here offers a quick and

simple way for busy physical therapists to screen likely patients for clinical risk factors so fractures and progression of osteoporosis can be prevented with lifestyle changes, and pharmacological and physical therapies.

More than 90% of hip fractures occur as a result of a fall.¹³ Hence, assessing for fall risk factors should be an integral part of osteoporosis screening, and fall prevention an aspect of treatment, especially since falls increase the risk for fracture independent of low bone mineral density.⁷ The most significant fall risk factors appear to be a history of falling, muscle weakness, along with environmental hazards and balance, cognition, and visual impairments.¹ These risk factors for falling are incorporated into the decision-making algorithm, demonstrating an integral facet of osteoporosis screening that is too often omitted.

CLINICAL SCENARIOS

Use of the proposed algorithm may best be illustrated through a variety of clinical scenarios of patient presentations including a younger patient with multiple risk factors for fracture, an asymptomatic postmenopausal woman, and a male patient with a history of long-term systemic corticosteroid exposure.

In the first clinical scenario, a 21-year-old female patient presents to an outpatient orthopaedic clinic with a stress fracture of

her left 5th metatarsal. Further evaluation uncovers that the patient is depressed and taking a selective serotonin re-uptake inhibitor in addition to Depo-Provera for contraception, has a vegan diet without any vitamin or mineral supplementation, is of Asian heritage, and weighs 115 pounds with a slender body frame. Using the algorithm (FRAX is eliminated for this patient due to young age), this patient is taking two medications associated with bone loss (Table 3), has low daily calcium and vitamin D intake, and a body weight less than 127 pounds. Also of note, she has already sustained a fracture, and bone mass typically peaks between the ages of 18-25; so this patient is at risk for never reaching her full potential peak bone mass due to her 4 clinical risk factors and age.^{1,14} This patient would fall into the intermediate risk category of the algorithm, and therefore should be referred to her PCP for further medical assessment in addition to recommendation of calcium and vitamin D supplementation and adequate protein intake (0.8 g per kg of body weight or more) through diet.

Next, a 56-year-old postmenopausal Caucasian female reports to physical therapy with a chief complaint of low back pain. A detailed exam shows that the patient has a low daily calcium intake, a FRAX of 6.2% 10-year risk for fracture and 0.5% for hip fracture, and no fall risk factors. According to the algorithm, this patient has 4 clinical risk factors in addition to a low FRAX, which places her at intermediate risk – warranting a referral to the PCP. Her physician recommends she have her BMD tested, which resulted in a T-score of -1.4, which is diagnostically categorized as low bone density. This patient did have unrelated low back pain; however, secondary to her BMD values, she is now also at moderate risk for fracture and would benefit from prevention, lifestyle changes, and consistent follow up and monitoring with clinicians. This patient represents an important at-risk population, of which there is little agreement in the field on how to manage this critical subgroup. Postmenopausal women with low bone density, but not osteoporosis, compose 50% of the fractures observed in the large National Osteoporosis Risk Assessment (NORA) study, with others reporting similar results.¹⁵ Hopefully the use of this algorithm in clinical physical therapy practice will identify and recommend treatment of this key subgroup earlier on in their disease, so the progression to fracture can be avoided.

Table 4. Conditions that May Be Associated with Reduced Bone Mass³

Female athlete syndrome	Cushing's disease
Hyperparathyroidism	Hyperthyroidism
Hypogonadism	Type 1 and Type 2 diabetes mellitus
Celiac disease	Inflammatory bowel disease
Liver diseases	Malabsorption
Primary biliary cirrhosis	Ehlers-Danlos syndrome
Gaucher disease	Homocystinuria
Hypophosphatasia	Marfan syndrome
Osteogenesis imperfecta	Ankylosing spondylitis
Rheumatoid arthritis	Systemic lupus erythematosus
Anorexia nervosa	Bulimia
Hemochromatosis	Hemophilia
Leukemia	Pernicious anemia
Porphyria	Thalassemia
Chronic obstructive pulmonary disease	Multiple sclerosis
Stroke	Paretic and paralytic states
Amyloidosis	Renal failure

Table 5. Circumstances that Indicate Referral to PCP or Specialist³

• Patients requiring BMD testing (preferably DXA)
• Patients in need of assessment and/or initiation of pharmacological therapy
• Patients at intermediate – severe risk based on the algorithm (Figure 1)
• Patients requiring a prescription for physical therapy intervention
• Patients with a loss of height ≥ 2 inches
• Patients with very low BMD
• Patients with any secondary cause for osteoporosis (Table 2)
• Patients not responding to treatment
• Patients with complex clinical circumstances

The last case is a 60-year-old male patient admitted to acute care for an exacerbation of his chronic obstructive pulmonary disease (COPD) with a 2-year history of daily 5 mg prednisone use, drug and alcohol abuse, muscle weakness, impaired balance, and a sedentary lifestyle. This patient has 5 clinical risk factors; most prominent is the prolonged glucocorticoid therapy (eg, 109 mg per day or more of prednisone for longer than 90 days), which is the most common cause of secondary osteoporosis. Osteoporosis related to medications or other conditions (Table 4) is referred to as secondary osteoporosis, and glucocorticoid-induced osteoporosis is usually demonstrated through fracture, which 30% to 50% of patients receiving long-term therapy incur.¹⁶ In addition, this patient has two fall risk factors of muscle weakness and impaired balance, which are compounded by the alcohol abuse (≥ 3 drinks/day), making him even more likely to fall. The FRAX data for this patient is 10-year fracture risk of 25%, 14% for hip fracture, and BMD T-score of -2.6, which is diagnostically osteoporosis. Communication with his physician, initiation of pharmacologic and physical therapy, and significant lifestyle changes are indicated for proper management of this severe risk patient as established

in this algorithm. Men are at equal risk for glucocorticoid-induced osteoporosis with women, and in general, make up 20% of those affected by osteoporosis. So, although women are the majority affected by osteoporosis, men are still at significant risk for osteoporotic complications.¹ Osteoporosis is preventable and treatable, but only if at-risk persons are identified promptly to receive effective therapy during the early phase of the disease, or prior to fracture.¹⁷

Physical therapists and other health care providers may consider referring patients to a primary care physician or specialist in the circumstances listed in Table 5. It is recommended that patients categorized in risk profiles of intermediate risk through severe risk be referred to their PCP to obtain BMD testing, be assessed for pharmacological treatment, and obtain a prescription for physical therapy treatment if necessary. A patient with a loss of height equal to or greater than two inches from their historical maximum may have sustained vertebral compression fractures and needs to be further evaluated. Patients who are not responding to physical therapy interventions or with a secondary cause for osteoporosis or complex clinical circumstances, are strongly recommended to see their PCP for interdisciplinary team

management and communication. The *Osteoporosis Care Coordination Request form* (see Appendix 1), a practical tool clinicians can use for referrals to PCPs, was developed to facilitate referral from the therapist to the physician.

PREVENTION AND TREATMENT

For the physical therapist managing patients with or at-risk for osteoporosis and fractures, prevention and treatment are closely associated. The objective of this article is not to give detailed recommendations for treatment or extensive information on medications; therefore, prevention will be the primary focus of this section. Main treatment goals will be highlighted, but there are many studies available discussing various populations and the specific types of exercise, treatments, and pharmacological therapies that would benefit individuals at-risk.

Nevertheless, “intervention begins with the identification of people at-risk or who have been identified as osteoporotic but who have not received any education, training, or rehabilitation.” Primary objectives of intervention should be focused on maintaining or increasing bone mass, preventing fractures, maximizing physical functioning, and improving quality of life. Patient education is of critical importance to obtain any benefit from intervention, especially when patients are asymptomatic and may perceive no advantage to comply with lifestyle changes or an exercise routine.¹⁷ In these situations, the patient must be made aware of the specific consequences of osteoporosis to stress the seriousness of the condition; these include: fracture, pain, immobility, and mortality. Patients should also be educated that a prevention routine will reduce the risk of these osteoporotic consequences, without negative side effects or excessive difficulty.¹⁸ Print materials, positive feedback, and a behavioral contract including achievable, short-term goals to build patient confidence and self-efficacy may all improve compliance.¹⁹

Several lifestyle changes to reduce the risk of osteoporosis are available and should be recommended to those with low bone mass and to the general population as well for fracture risk reduction.^{1,3} Front line prevention includes adequate daily intake of calcium and vitamin D. Recommended intake values are somewhat controversial; however, the Institute of Medicine states that daily recommended dietary allowances

for calcium and vitamin D differ with various age groups and is a good resource to use when recommending supplementation as a lifestyle change. The values of at least 1,200 mg per day of calcium and 800 IU per day of vitamin D represent the recommended daily intake for most age groups and are well within the upper level intake values.²⁰ Lifelong calcium intake is necessary for accruing peak bone mass and then maintaining bone health as calcium is primarily stored in the skeleton. When there is inadequate external intake, bone tissue is reabsorbed to maintain serum calcium levels, subsequently reducing bone density. Vitamin D deficiency is common among older adults; yet this vitamin plays a major role in calcium absorption, bone health, muscle performance, balance, and risk of falling. The NOF has excellent resources for a bone health diet, including a Calcium Calculator for patients to determine the calcium content of the foods they are eating. Other significant lifestyle modifications include good nutrition, smoking cessation, and reduction of excessive alcohol use, which negatively affects bone health and increases fall risk. Regular weight-bearing physical activity is a key component of preventative lifestyle measures, and is detailed below.¹

Comprehensive rehabilitation therapy for bone health consists of strengthening, coordination, balance, flexibility, and aerobic exercises.¹⁸ Regular weight-bearing exercise can build bone mass, slow the decline of BMD, prevent fracture, improve muscle mass and strength, and balance. A key feature for compliance with any long-term exercise program is determining that the patient is interested and motivated to participate on a consistent basis. Being active can reduce hip fracture incidence by 50% in adults 65 years or older.¹⁷ Hongo et al²¹ found that a simple home exercise program of spinal extension exercises for 3 to 5 minutes daily was found to increase back extensor strength and improve quality of life in older postmenopausal women. In a small study by Bergstrom et al,²² walking supplemented with one to two hours per week of aerobic or muscle strength training in addition to calcium and vitamin D supplementation was sufficient to induce a small but significant increase in spinal BMD of premenopausal women with idiopathic osteoporosis. Overall, weight bearing and muscle strengthening exercise offer many health benefits including improving agility, strength, posture, and balance, all of which

Table 6. FDA Approved Medications for Osteoporosis Treatment³

Alendronate**	Risedronate**
Ibandronate**	Zoledronate
Raloxifene** (estrogen agonist/antagonist)	Calcitonin
Teriparatide (parathyroid hormone)	Denosumab
Zoledronic acid**	Estrogen**
*FDA. U.S. Food and Drug Administration	
**Medications approved for <i>prevention</i> of osteoporosis	

may reduce the risk of falls. Consequently, exercise and osteoporosis prevention are interrelated and physical activity should be a part of daily life for persons of every age, as benefits are lost when a person stops exercising.

Fall prevention is an essential facet of physical therapy care for patients with osteoporosis. Falls are the precursor to many fractures and consequent immobility. Balance training has been shown to be more effective at improving functional and static balance, mobility, and reducing rate of falls than programs that consist mostly of aerobic, muscular strength, or flexibility exercises.¹⁵ Compliance to balance programs is enhanced by providing a social and pleasant environment, and supervision by an experienced physical therapist.¹⁵ Even though balance is a crucial element it is only one component of a thorough therapeutic program. A randomized control trial from Teixeira et al²³ found that a strengthening program of progressive load training of the quadriceps and proprioceptive exercises improved static and dynamic balance, increased the speed of motor responses, and therefore enhanced the performance of daily activities and reduced the frequency of falls in women with postmenopausal osteoporosis.²³ Muscle strength training that combines movement and axial loading increases bone mechanical strength, thus lowering risk of fracture. It is important to note that an increase in bone mechanical strength is not always reflected in densitometric evaluation.¹⁸ The size, shape, and distribution of bone mass as a result of loading are the factors that influence bone mechanical strength, all of which can be modified without an increase in bone mass.¹⁸ Therefore, it is possible to improve the mechanical strength of bone through interventions, without an increase in BMD. In addition to building strength, restoring proper muscle length relationships is of importance to avoid contractures and malalignment, which can lead to a propensity for falls through creating unfavorable

levers and balance disorders.¹⁸ Removal of environmental hazards such as throw rugs, clutter, and poor lighting can also aid in fall prevention.

Functional protective training, an essential of fracture prevention, consists of educating patients to avoid flexion, side bending, and spinal rotation or activities like golfing, bowling, or biking that combine these movements.^{17,24} The compressive forces associated with these movements, especially forward flexion that compromises the vulnerable anterior vertebral body, can contribute to vertebral compression fractures. Maintaining a neutral spine throughout various forms of exercise and activities of daily life should be promoted in addition to performing a balanced strengthening routine on a consistent basis. Some support exists for the benefits of Tai-chi, yoga, and Pilates for at-risk patients.²⁴ Medications are also available to manage osteoporosis and reduce fracture risk²⁵ (Table 6). In all situations, a multifaceted intervention approach including communication with PCPs is recommended to address the many aspects of comprehensive patient care.

TRACKING PATIENTS

Response to interventions and lifestyle changes can be monitored by follow-up DXA scans; however, no randomized trials have directly assessed the value of these tests in relation to treatment persistence or fracture reduction.^{3,26} Nonetheless, serial testing of BMD can give valuable information; for instance, if a patient's BMD improves or remains unchanged, that is considered a good response to therapy.²⁶ The general recommendation for those in treatment is a repeat DXA every one to two years, especially if on medication.³ If BMD becomes stable or if individuals are at low risk, less frequent monitoring is sufficient. New fracture or continual loss of BMD is suggestive of poor patient compliance, inadequate response to therapy, or an undetermined secondary cause of osteoporosis.²⁶

Noncompliance is a prevalent problem in this population, and is associated with an increased risk of fracture. It has been shown that fracture rates of those 50% adherent to bisphosphonate therapy were no different to those of individuals on no medication at all.³ Therefore, physical therapists must educate patients and reinforce compliance with medications to achieve the largest fracture risk reduction. Further research is necessary to determine how best to optimize the rate at which patients undergo BMD testing; however, reassessment should not be performed more frequently than every year for meaningful data.^{11,27} On the other hand, there is no limit to the use of fracture risk assessment, like FRAX, which can provide information that is easy to understand for both clinicians and patients, compared to the T-scores produced from DXA scans.¹²

The guidelines put forth by the NOF are illustrated and recommended in this article; however, there are other guidelines that are available to clinicians. The National Osteoporosis Guideline Group (NOGG) of the United Kingdom uses FRAX as well; however, their recommendations contain intervention thresholds that are age-dependent, whereas NOF guidelines, are driven by cost-effectiveness.^{7,26} Under the NOGG approach, a significantly smaller subset of the population would be indicated for treatment in comparison to NOF guidelines; a fact to consider when differentiating between the two guidelines.²⁶ Other various screening recommendations from major professional and health care organizations are available, although most reiterate the suggestions made here with some subtle differences.¹²

Studies by Bogoch et al⁴ and Strassberger et al²⁸ explore the effectiveness of an integrated multidisciplinary approach to the identification and management of patients with osteoporosis and osteoporosis-related fragility fractures in Canada and Germany respectively. In both studies, the role of an osteoporosis care coordinator was essential to put theories into practice, and for Bogoch et al⁴ to achieve high rates of appropriate diagnosis, treatment, or referral for osteoporosis care for > 95% of patients. The responsibilities of the care coordinator included: screening clinical databases to identify patients that would benefit from osteoporosis care, advocating for BMD evaluation, patient education regarding osteoporosis and its management including instruction for vitamin D and calcium sup-

plementation, administering questionnaires, supervising specialized clinics and registration, documentation, and communicating with treating doctors and health insurance providers. Participation of all orthopaedic surgeons and residents, orthopaedic technologists, allied health care professionals, and administrative staff as well as a dedicated osteoporosis coordinator was necessary for comprehensive screening, education, and referral of appropriate patients.⁴ Success of these exemplary coordinated osteoporosis care programs suggest that implementation into the American health care system would increase the amount of at-risk patients appropriately identified and managed and potentially reduce osteoporosis-related fractures and associated costs. Physical therapists' education, clinical background, and communication skills with patients and clinicians make them a primary candidate for the key role of osteoporosis care coordinator. Although this potential coordinator position seems ideal for fracture prevention, factors to consider with future research include cost-effectiveness of the coordinator position, feasibility in the American health care system, and outcomes. Since public awareness, self-advocacy, and caregiver vigilance are not sufficient to consistently identify the majority of the patients who are at risk for fractures, changes to osteoporosis management need to be made, such as establishing coordinator positions to improve future care.

CONCLUSION

Osteoporosis is preventable and treatable, but only if at-risk persons are identified promptly enough to receive effective therapy during the early phase of the disease, or prior to fracture.¹⁷ Multifaceted treatment consisting of teamwork between health professionals, less reliance on medications, and more individuals taking ownership of their physical health and bones, is hopefully the way of the future. In the midst of the heterogeneity of practice guidelines and confusion regarding screening, osteoporosis is easily identifiable.²⁷ Physical therapists are targeted in this paper because they have a pivotal yet under-recognized role in the care of at-risk patients. They have contact with patients pre- and postfracture, and can make a dramatic difference in their risk levels with recommending lifestyle changes, instruction on prevention techniques, and referring to other health care professionals. Decreasing the risk of osteoporosis, falls, and fractures is the aim of osteoporosis care, and further lit-

erature for physical therapy prevention and treatment is warranted. Clinical algorithm use and awareness of the scope of the osteoporosis problem enables physical therapists to make a positive impact on this preventable, yet growing, health epidemic.

ACKNOWLEDGEMENTS

Thank you to all that made this article possible. Special thanks to Diane Heislein, contributor and mentor for the project. Sincere appreciation to Hawley Almstedt, DeAnne Daly, and Todd Shoepe for their valuable deliberation. Consideration to Sara Meeks for her clinical expertise and consultation. Lastly, Mary Ip--the inspiration for the mission.

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(Appendix appears on page 76)
- ERGONOMIC EXPOSURE ASSESSMENT METHODS FOR IDENTIFYING MUSCULOSKELETAL DISORDER RISK IN THE WORKPLACE: AN EXAMPLE FROM THE GROCERY INDUSTRY**
(continued from page 66)
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Osteoporosis Care Coordination Request

Name: _____
DOB: _____ Age: _____
Sex: M / F
MRN: _____

PT Visit Date: _____
PT: _____
PCP: _____
Medical Diagnosis: _____
PT Diagnosis: _____

Reason for Referral to PCP:

Clinical Risk Factors:

- Female > 65 years of age
- Male > 70 years of age
- Fragility fracture > 40 years of age
- Body weight < 127 lbs.
- Chronic glucocorticoid use; or other medications that induce bone loss; _____
- Low daily Calcium (<1200mg) + Vitamin D intake (< 800 IU)
- Condition associated with bone loss; _____
- Postmenopausal status
- Early menopause < 45 years of age
- Caucasian or Asian race
- Parental history of hip fracture
- Cigarette smoking
- Alcohol abuse (>3 drinks/day)
- Sedentary/↓ physical activity
- Osteopenia on radiography

Fall Risk Factors:

- History of falls
- Decreased Balance
- Muscle weakness
- Impaired vision
- Impaired cognition
- Environmental hazards

[FRAX® 10-year Fracture Probability]:

- Major Osteoporotic Fracture = _____%
- Hip Fracture = _____%

PT Risk Assessment:

Requests for PCP:

- Bone Mineral Density imaging:
 - DXA
 - Radiography of _____
- Assessment for pharmacological prevention/treatment of osteoporosis
- Prescription for Physical Therapy for Osteoporosis treatment

[PT Contact Information: _____]

- Please contact me to discuss: Urgent Within 1 month Next Available

Effects of the Thoracolumbar Exercise Program on Static Standing Balance and Pain in Low Back Pain Patients

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ABSTRACT

Study Design: A randomized clinical trial. **Background and Purpose:** Several exercise programs have been reported to be beneficial in the treatment of low back pain (LBP). This study examined two different exercises, thoracolumbar exercise (TLE) and lumbar stabilizing exercise (LSE), for LBP. **Methods:** Ninety subjects (42 male, 48 female), who had mechanical LBP without other neurological symptoms, were exercised for 40 minutes, 3 times/week, for 8 weeks. This trial examined the Oswestry Disability Index, pain, static standing balance, thoracic mobility, and lumbar flexibility. **Results:** Subjects who participated in the TLE program were better than the LSE on the Oswestry Disability Index, thoracic mobility, and static standing balance. However, subject performances did not significantly differ in either exercise group in terms of pain and lumbar flexibility. **Discussion:** The TLE program has been demonstrated to be effective in patients with LBP in terms of lumbar functional disability including static standing balance.

Key Words: thoracolumbar exercise, low back pain, static standing balance

INTRODUCTION

The costs attributable to low back pain (LBP), one of the most common forms of chronic musculoskeletal problems, continue to increase and the recurrence rate is from 60% to 86% in an industrial setting.^{1,2} Several researches³⁻⁷ were reported to have identified the factors of LBP occurrences. It has been found that unexpected movement, especially rotation, lifting a heavy load, and stress, in several muscles of spinal segments has been related to LBP.⁸ For LBP, the instability at the spinal segmental level has been proposed to be the loss of control or hypermobility in the spinal segment that is associated with compensation of hypomobility

joints and muscle weakness.^{2,9,10} Also, the limitation of thoracic movement has caused compensatory motion that provided pain at the cervical and lumbar segmental level in persons who had thoracic stiffness, increased kyphotic curve, or a sedentary life style.^{9,11-13}

In the majority of cases, LBP requires long-term treatment. Therefore, effective management to relieve symptoms and prevent a chronic condition becomes an important issue. Recent research has focused on the role trunk muscles play in lumbar support. A study by Brontfort et al¹⁴ showed that patients who received supervised trunk exercise were most satisfied with care and increased trunk muscle endurance and strength both over a short- and long-term time period. Core muscles attached to the spine such as transversus abdominis, multifidus, and the erector spinae provide stabilization by forming a corset around the spine.^{15,16} The dysfunction of multifidus tends to increase symptoms and the recurrence rate of LBP.¹⁷⁻¹⁹ Thus, specific exercise based on the transversus abdominis muscle and lumbar multifidus has been shown to decrease pain and disability²⁰ and specific exercise of multifidus has been shown to decrease recurrence of LBP in one to 3 years of follow-up after treatment.² Another specific exercise for thoracic mobility was used to decrease compensatory motion of lumbar segments¹² and improve the lumbar mechanical stability that is such an important factor of LBP.²¹ However, although the loss of thoracic motion has been shown to trigger the overuse and loss of control in the lumbar region,¹⁰ most exercise studies that have been published relate LBP to the activation of lumbar muscles. The purpose of this study was to compare the effect of an active thoracolumbar exercise program with a lumbar stability program in the treatment of patients with LBP on pain, disability index, thoracic mobility, lumbar flexibility, and static balance.

Symptoms of a back problem include limited range of motion (ROM), loss of flexibility and balance, decreased endurance, as well as an increase of pain. Other studies on balance reactions using subjects with LBP have shown that postural sway was significantly greater and that the patients kept their body center of gravity more posterior compared to a healthy population.^{22,23} The review by Mann et al²⁴ presented significantly higher amplitudes of center of pressure (CoP) for anterior-posterior direction during standing and the velocity of CoP was larger for subjects with LBP when compared to a healthy back group. As with previous studies, LBP influenced balance in quiet standing. The purpose of this study was to investigate the effect of both spine exercises on body balance during standing in subjects with LBP. In order to study the static standing balance in this study, we used a portable force platform because it represents a more practical and time-efficient technique for use in a clinical setting.

METHODS

Participants

A total of 258 participants who were recruited through visits at the hospital rehabilitation center in Seoul, Korea, volunteered in this study. However, 161 subjects were excluded due to involving the other orthopaedic conditions or surgery, incomplete data collection, or refusing participation during baseline assessment. Seven subjects had other reasons for not participating. Of the remaining 90 subjects (42 male, 48 female), 45 were randomly assigned to the thoracolumbar exercise (TLE) group and 45 were randomly assigned to the lumbar stability exercise (LSE) group. Eligible participants included individuals between the ages of 20 and 30 who had a primary complaint of mechanical LBP and were admitted by interview and questionnaire. Mechanical LBP was

defined as pain that had no specific identifiable etiology but that could be reproduced by specific back movements. The exclusion criteria were rheumatologic conditions, other orthopaedic disease or pathologic conditions, previous lumbar surgery, neurological symptoms in lower extremities, and current pregnancy. All the procedures were explained to the subject before the study and we obtained informed consent from each subject, as appropriate.

Interventions

The study was a randomized clinically controlled study. All of the subjects were receiving conservative physical therapy for complaints of LBP including 15 minutes of hot pack and 15 minutes of electrotherapy.

After finishing traditional therapy, members in either the TLE group or LSE group were required to perform each prescribed exercise for 40 minutes, 3 days a week, over a period of 8 weeks. All patients were individually instructed to perform the following exercises by an experienced physical therapist (Appendix 1). The TLE program was based on McKenzie extension exercise and specific training for improvement of thoracic mobility. The LSE program was based on William flexion exercise and specific training of transversus abdominis muscle with co-activation of lumbar multifidus at lumbosacral region. Each exercise program was composed of 3 stages; the warm-up stage for 5 minutes, main stage was formed for 4 different exercises (TLE: trunk rotation, thoracolumbar extension exercise in prone, supine, and sitting; LSE: pelvic tilting, bridge, kneeling opposites, and bent-knee leg lift), and cool-down stage for another 5 minutes. The main focus of the exercise programs was individualized in terms of intensity such as repetitions of set according to the patients' abilities. The patients were instructed to perform repetitions of the main exercise for 30 minutes or until they could no longer do so using proper form, or they experienced back pain during the intervention period.

The assessment of both groups was performed by one independent examiner who was blinded to group allocation and presentation. The following tests were conducted to establish a baseline level and to monitor improvement of symptoms: disability (Oswestry LBP Disability Index), pain (Visual Analog Scale), static standing balance (using Gaitview AFA-50 system, alFOOTs Co, Ltd, Seoul, Republic of

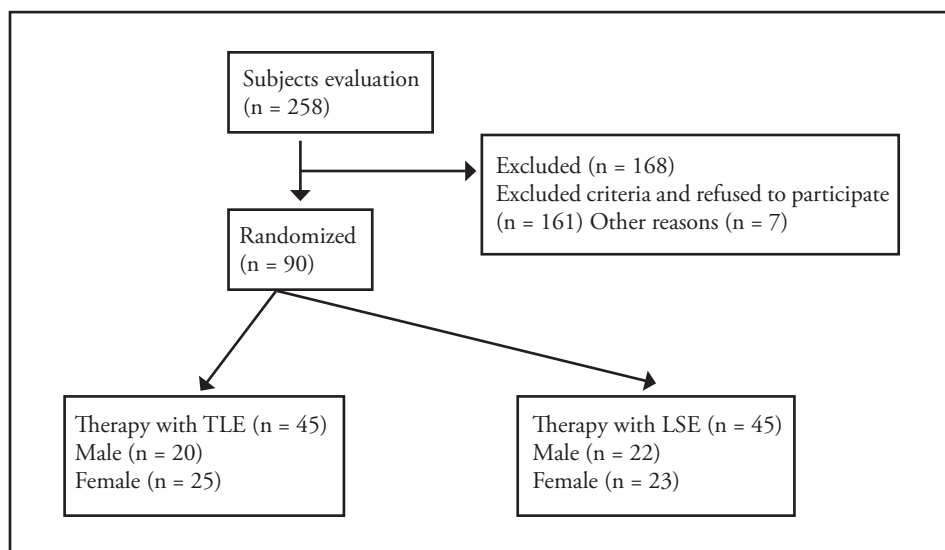


Figure 1. Subject flow chart.

Korea), thoracic mobility (Thoracic Mobility Test), and lumbar flexibility (Skin Distraction Test).

Outcome Measures

The main outcome measures were administered at the time of pre-exercise, 4 weeks after completion of the exercise period, and again 8 weeks after the end of the session. For rating the severity of LBP, each subject completed the Oswestry LBP disability index, which is a self-report questionnaire using 10 questions that addresses pain, personal care, and activities of daily living (ADL) including lifting, walking, sitting, standing, sleep, sexual and social activities, and travel. The subjects provided a score from zero (no pain) to 5 (worst pain) to indicate intensity of pain. The disability index result was explained by percentage (%). The reliability of Oswestry LBP disability index has been previously found to be .99.²⁵ Patient-rated pain was measured using a visual analog scale. The subjects were asked to rate their level of back pain on a zero to 10 scale, with zero representing "no pain" and 10 being "worst pain possible." The CoP excursion was measured using a portable force platform (Gaitview). During the measurement of static standing balance, the subjects were instructed to look straight ahead and stand as still as possible in the center of the platform. The CoP trajectory (mm²) was recorded for 30 seconds with eyes closed. For thoracic mobility assessment, our thoracic mobility test was defined as, the amount of thoracic spine motion as the length from heel to tip of middle finger while each subject maintained the normal

lumbar lordotic curve and raised up their arms as much as possible. The outcome was recorded as the percent change in height from standing height (%). Subjects repeated the mobility test 3 times to obtain the mean of thoracic extension. Lumbar flexibility was assessed using the skin distraction test; the examiner obtained the length from C7 to S1 spine midline landmarks. Measurements were taken in both an upright standing position (initial) with arms crossed over their chest and fully flexed (final) postures. Between-measurement differences were then calculated and expressed as a percentage (%).

Statistical analysis

The data was analyzed using statistical software SAS for Windows 9.1. Means and standard deviations were calculated. An independent t-test was used to compare subjects' characteristics between groups. A repeated measure analysis of variance (ANOVA) with one within-subjects factor (condition: pretest, 4 weeks, and 8 weeks) and one between-subject factor (group: 2 difference exercise) was used to determine the main effects and the interaction for each tested method. The level of significance was set at $p < .05$.

RESULTS

Ninety subjects who met subject criteria were randomized for this study from a total of 258 subjects. A summary of participants is shown in Figure 1. All randomized subjects' characteristics are represented in Table 1. There was no statistical difference between groups for interventions ($p > .05$).

Table 1. Subjects' Characteristics

	TLE	LSE	p value
Sex			
Male	20 (44.4%)	22 (48.9%)	0.832
Female	25 (55.6%)	23 (51.1%)	
Age (yrs)			
20 years	21 (46.7%)	23 (51.1%)	0.833
30 years	24 (53.3%)	22 (48.9%)	
Height (cm)	166.8 ± 7.5	166.1 ± 7.6	0.646
Weight (kg)	64.5 ± 12.7	65.0 ± 11.2	0.820
BMI			
22 >	20 (44.4%)	15 (33.3%)	0.462
22 ≤ BMI < 25	8 (17.8%)	12 (26.7%)	
25 ≤	17 (37.8%)	18 (40.0%)	
Working period (months)	23.7 ± 17.7	30.6 ± 24.6	0.131
Intensity of working			
Office job	11 (24.4%)	14 (31.1%)	0.779
Light work	12 (26.7%)	11 (24.4%)	
Heavy work	22 (48.9%)	20 (44.4%)	
Type of working			
Full time	38 (84.4%)	36 (80.0%)	0.210
Independent worker	6 (13.3%)	4 (8.9%)	
Per diem	1 (2.2%)	5 (11.1%)	
TLE= thoracolumbar exercise, LSE=lumbar stabilizing exercise, BMI=body mass index			

Table 2. Patient-rated Outcomes at Each Measurement Period

	Baseline	4 weeks	8 weeks	adjusted p value
Oswestry LBP Disability Index				0.018*
TLE	32.97 ± 9.81	21.51 ± 7.61	11.89 ± 6.58	
LSE	30.25 ± 10.63	21.17 ± 8.53	13.54 ± 7.67	
Thoracic mobility (%)				0.001*
TLE	0	1.18 ± 1.56	1.78 ± 1.51	
LSE	0	0.77 ± 0.48	0.76 ± 0.54	
Static standing balance				0.033*
TLE	6.02 ± 1.73	3.24 ± 1.23	1.18 ± 0.63	
LSE	5.64 ± 1.93	2.91 ± 1.33	1.51 ± 0.87	
Visual analog scale				0.403
TLE	5.87 ± 0.99	4.02 ± 1.12	2.02 ± 0.94	
LSE	5.84 ± 0.95	4.27 ± 1.03	2.27 ± 0.94	
Lumbar flexibility (%)				0.404
TLE	0	32.55 ± 14.31	60.65 ± 21.55	
LSE	0	30.54 ± 17.43	55.38 ± 26.33	
LBP=low back pain, TLE=thoracolumbar exercise, LSE=lumbar stabilizing exercise *p < .05				

The patient-rated outcomes for each measurement period are shown in Table 2. Both groups demonstrated improved outcomes throughout the 8-week treatment period. Results of the repeated measures ANOVA showed statistically significant improvements ($p < .05$) in intervention effects for the TLE group on Oswestry LBP disability index score, thoracic mobility, and static standing balance. There were no statistically significant differences between groups for pain and lumbar flexibility.

DISCUSSION

The main finding of this study was that the TLE group performing thoracic mobility exercise was considerably more effective in increasing thoracic mobility (%), improving static standing balance, and scoring more favorably on the Oswestry Disability Index compared to patients with LBP who were in the LSE group. This study used the length of the standing body to evaluate the thoracic movement as previously described by Yang et al.²⁶ In both exercise groups, the pain scale was decreased and lumbar flexibility was increased; the TLE group showed more improvement, but the differences were relatively small and not statistically significant.

Recent studies have reported that LBP is caused by a deficient stabilization of lumbar segments or a decreased strengthening of the trunk extensors and flexors.²⁷⁻³¹ Trunk flexor weakness may reduce spinal stability by not providing adequate intra-abdominal pressure.³¹ In addition, previous reviews have suggested that back muscle strengthening is important to protect the lumbar segmental function.^{2,14,15,21,32} In the current study, two different randomized groups performed exercises that were intended to strengthen the superficial muscles of abdomen and trunk in patients with LBP. For the results of pain and functional impairment, our findings are supported by other studies. The study by França et al²¹ reported that segmental stabilization (transversus abdominis and lumbar multifidus) and superficial strengthening (rectus abdominis, external and internal oblique, and erector spinae) exercises were effective in relieving pain and decreasing functional disability. In a study by Bronfort et al,¹⁴ the group involved in supervised trunk exercise therapy showed more improvement than the group receiving spinal manipulative therapy or home exercise on the variables of trunk strength and endurance at short- and long-term (52 weeks) outcomes. However, many authors

reviewed the specific exercise of lumbar segments for LBP to determine whether to increase abdominal/back muscle strengthening or to stabilize lumbar/sacroiliac segments.^{2,20,21,29,33} Our study demonstrated increases in thoracic mobility in order to compensate for the deficiency in lumbar segment motion. The TLE group was shown to have better improvement in our measures of functional ability. Our result demonstrated that the abnormal movement control of other relative segments may also be used as a method for increasing lumbar stability.^{34,35} Improvement among the LSE group was also shown and supported in previous studies.^{33,36}

There is also an association between body balance reactions and lower back pain. Byl et al³⁷ explained that body sway was higher in the LBP group compared with the healthy back group under different balance conditions and LBP subjects have more difficulty in maintaining balance using a conservative strategy. For balance, patients with LBP had delayed muscle response times in an unstable sitting situation.³⁸ Postural alignment and balance responses have been accounted for by various systems (ie, visual, proprioceptive, and vestibular.). In particular, visual input has been found to have the most effect on body sway to maintain the upright position.³⁹ The current study excluded visual control (eyes closed) while balancing on a standing fulcrum. The LBP group showed larger amplitudes of body sway from a hip/back strategy to ankle strategy in order to relieve back stress.²² Our study findings suggest that back specific exercise, especially thoracic mobility exercise, which entailed moving the trunk on the extremity, resulted in a reduction in body sway. Further studies are needed to determine the exact mechanisms through which TLE enhances the balance activities.

In our study, we limited the outcome measurements to the thoracic mobility test and lumbar flexibility test. More evidence using a larger study population is required to further substantiate the findings of this study. Also, a limitation of this study is the lack of blinding of the potential impact only for thoracic mobility because exercises were influenced by the global mobility of entire spine segments. As a result, further investigation is needed to identify more specific elements in thoracic mobility exercise of an individualized program in patients with lower back pain. In fact, a long-term follow-up study of the TLE is needed to evaluate

the importance of specific thoracic exercise and its inclusion to lower-back exercise programs in clinic.

CONCLUSION

The results of this study suggest that specific exercise that includes thoracolumbar mobility exercises is more effective in reducing LBP, improving thoracic mobility, static standing balance, and functional abilities compared to a lumbar stabilization program.

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Appendix 1. Method of the Exercise Program

Group 1. Thoracolumbar Exercise Group



Trapezius and levator stretch

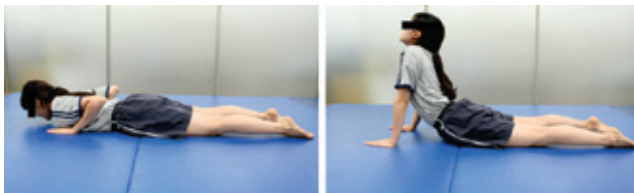
Method

The subject was instructed to hold this stretch for 10 seconds.



Trunk rotation exercise

To start, the subject was required to lie on her right side with a roll on the thoracic area placing the bent left leg over the right leg. The subject then placed her extended right arm to the side while holding a 1 kg dumbbell in her left hand. For trunk rotation, the subject slowly moved her left arm and neck to the left side without rotating the pelvis and leg. The position was held for 10 seconds. This motion was repeated in the opposite direction. The subject was instructed to breathe freely and deeply throughout the exercise and keep her abdominal muscles tight. The motion was repeated 10 times with 5 seconds rest between each session.



Thoracolumbar extension exercise in prone

At the starting position, the subject lies down on her stomach with her toes touching the floor. Lift chest with support of both hands and extend head and trunk, while maintaining the straight line from hand to shoulder. The position was held for 10 seconds and then return to the starting position. This motion was repeated 10 times with 5 seconds rest between each session.



Thoracolumbar extension exercise in prone

The subject lies down and bends knees with feet flat on the floor. Subject holds 1 kg dumbbell in each hand and places a roll on the thoracic area. Slowly move both shoulders from 90° to 180° flexion and maintain extension of elbow. The position is held for 10 seconds and then return to the starting position. The subject breathes freely and deeply throughout the exercise and keeps abdominal muscles tight. The motion was repeated 10 times with 5 seconds rest between each session.



Thoracolumbar extension exercise in sitting

At the neutral sitting position on a chair with a back rest, subject places hands on her occiput. Slowly extend the trunk only and maintain chin-tuck position while subject exhales. Do not extend neck. Hold the position for 10 seconds and then return to the starting position. The motion was repeated 10 times with 5 seconds rest between each session.

Follow-up: Treadmill

The subject walks on the treadmill at a speed of 1.0-3.0 km/h for 5 minutes.

Appendix 1. Method of the Exercise Program (continued)

Group 2: Lumbar Stabilizing Exercises



Hamstring stretch

Method

At the starting position, the subject lies down on the floor, and then slowly bends the right knee grabbing the back of thigh with both hands. The subject pulls the leg towards her chest gently, keeping the left leg extended and both hips on the floor. The position was held for 10 seconds. This motion was repeated on the opposite side and then returned to the starting position. The motion was repeated 10 times with 5 seconds rest between each session.



Pelvic tilting exercise

For the pelvic tilt, the subject was required to lie on her back, bend knees, with feet flat on the floor. The subject then flattened the curve of her back and simultaneously tightened her buttocks and abdomen. This position was held for 10 seconds and then return to the starting position. The motion was repeated 10 times with 5 seconds rest between each session.



Bridge exercise

To start, the subject lies down, crosses her arms on the chest, bend knees with feet placed flat on the floor. During the motion, press the heels into the floor and squeeze the gluteals and contract the abdominals while lifting the pelvis. The subject holds the position for 10 seconds and then returns to starting position. The motion was repeated 10 times with 5 seconds rest between each session.



Kneeling opposites

At the starting position, the subject kneels on the floor and places her hands below shoulders and knees below hips. The subject extends left leg backward and the right arm forward simultaneously while tightening the gluteal and abdominal muscles and keeping the spine as straight as possible. Hold a straight line from hand to shoulder, shoulder to hip, and hip to foot for 10 seconds. The motion is repeated with opposite limbs. Subject breathes freely and deeply throughout the exercise and keeps abdominal muscles tight. The motion is repeated 10 times with 5 seconds rest between each session.



Bent-knee leg lift

To start, the subject lies down and bends her knees with feet placed flat on the floor. The subject then raises one leg towards her chest to keep the knee in a bent position until the hip is in 90° flexion and simultaneously pushes the knee with both hands. Perform a slight curl or crunch by contracting the abdominal muscles. This position was held 10 seconds. This motion was repeated with the opposite leg and then return to starting position. This motion was repeated 10 times with 5 seconds rest between each session.

Follow-up: Treadmill

The subject walks on the treadmill at a speed of 1.0-3.0 km/h 5 minutes.

Book reviews are coordinated in collaboration with Doody Enterprises, Inc.

Orthopaedic Practice (OP) is interested in having readers serve as book reviewers. Previous experience is recommended but not required. Timeliness in meeting publication deadlines is required. Invitation is only open to Orthopaedic Section members. Successful completion of each review results in the reviewer retaining a free copy of the textbook.

If you are interested, please contact Michael Wooden, Book Review Editor for OP at: michael.wooden@physiocorp.com

Orthopaedics for the Physical Therapist Assistant, Jones & Bartlett Learning, 2012, \$67.95
ISBN: 9780763797553, 733 pages, Soft Cover

Editor: Dutton, Mark, PT

Description: As noted in its preface, this book focuses on essential anatomy and biomechanics information for each major body area and provides evidence-based guidelines for the assessment and rehabilitation of orthopedic patients. **Purpose:** The aim is to fill a void in the literature for physical therapist assistant students. **Audience:** The book is designed for physical therapist assistant students who are studying orthopedics. The author is a physical therapist who is well qualified to write this book. **Features:** The 25 chapters are divided into four sections. The first seven chapters discuss concepts of orthopedic management, the muscular and neurological systems, tissue injury and repair, manual modalities, and physical agents and mechanical modalities. The four chapters in the second section deal with therapeutic exercise and activities for improving range of motion, flexibility, joint mobility, muscular performance, and balance. The 10 chapters in the third section take a regional approach to covering the vertebral column, sacroiliac joint, temporomandibular joint, rib cage, upper extremity, and lower extremity. Each of these chapters generally follows a similar format, with a discussion of the anatomy and kinesiology, regional examination components, intervention strategies for the acute and chronic/functional phases, descriptions of common conditions and surgeries, and therapeutic techniques specific to the region. The four chapters in the last section cover the pediatric and geriatric orthopedic patient, women's health, and gait and posture. Each chapter contains learning objectives to guide study, key point boxes for easy reference, and short answer/multiple choice review questions. Over 700 images, including tables, line drawings, and photographs supplement the text and extensive reference lists round out all chapters. Five appendixes include a guide to conduct for physical therapist assistants, documentation, commonly used abbreviations, common laboratory values, and proprioceptive neuromuscular facilitation terms and techniques. **Assessment:** This is an outstanding contribution to the field. It is a well-written, comprehensive book that is ideal for orthopedic courses taught to physical therapist assistant students. It also would serve as an excellent resource for physical therapist assistants working in orthopedic settings.

Michael D Ross, PT, DHSc
United States Air Force

Physical Therapy Prescriptions for Musculoskeletal Disorders, Lippincott Williams & Wilkins, 2011, \$71
ISBN: 9781605476728, 280 pages, Soft Cover

Authors: Cooper, Grant C., MD; Chait, Evan, PT

Description: This book uses case-based presentations of musculoskeletal disorders to help physicians understand and write effective physical therapy prescriptions, what takes place during physical therapy, and how physical therapists fulfill prescriptions. Each case is followed from the physician's examination to the physical therapy evaluation and treatment. **Purpose:** The purpose is to help musculoskeletal physicians understand the physical therapy process once a prescription is written. The training of medical students, nurse practitioners, physician assistants, osteopaths, physiatrists, and residents offers little time for understanding the role of physical therapy. A book explaining this role for those in disciplines unfamiliar with physical therapy is needed. **Audience:** The target audience is physiatrists, orthopedists, rheumatologists, neurologists, family practitioners, physician assistants, physical therapists, occupational therapists, residents, and students. It would be helpful to medically trained clinicians who refer patients for physical therapy. **Features:** The book uses a consistent format for the 34 case presentations, beginning with a physician's examination and concluding with the physician's impression of the case and plan, one aspect of which is a referral to physical therapy. The next section in each case is a physical therapy examination, subjective and objective, including ROM, joint play, special tests, MMT, neurodynamic testing, tight tender points/soft tissue restrictions, posture and ergonomics. This is followed by the assessment and the plan, including manual therapy, modalities, and a home exercise program. Each case ends with an orthopedic rehabilitation prescription that is filled out to reflect the plan of care. The book has good photos of therapeutic exercise for each case that demonstrate the prescribed exercise and give the referring practitioner an idea of what their patients may be doing in physical therapy. It also provides a basic outline of a physical therapy examination and prescription based on the findings of the evaluation. It would have been helpful to introduce the target audience to the grading scale of MMT, ROM, neurodynamic testing, joint play, and ergonomics, since all of these concepts may be outside their training. The cases offer no evidence-based treatment based on the evaluation. Some of the findings on the evaluation are inconsistent with the exercises presented (e.g. Achilles tendon stretch picture when ankle ROM is the norm). The physical therapy examinations lack any outcome surveys or functional tests which would be important information for referring practitioners. Finally, the physical therapy assessment uses ICD-9 diagnostic language instead of incorporating the International Classification of Functioning, Disability, and Health (ICF) which is the preferred diagnostic code for physical therapy. **Assessment:** This book may be useful to current or future referring practitioners. It gives some insight into a physical therapy evaluation, treatment, and prescription. It would not be appropriate for physical therapy students, physical therapist assistants, or physi-

cal therapists. A more comprehensive book on physical therapy evaluations and treatment that are evidence-based would be more appropriate for them.

*Daryl Lawson, PT, DSc
Elon University*

Teaching and Learning in Physical Therapy: From Classroom to Clinic, Slack Incorporated, 2011, \$43.95
ISBN: 9781556428722, 257 pages, Soft Cover

Editors: Plack, Margaret M., PT, EdD; Driscoll, Maryanne, PhD

Description: This book details strategies for improving the effectiveness of teaching and learning in a wide variety of settings and situations. **Purpose:** It aims to raise readers' awareness of the concept that teaching and learning are inseparable and to provide them with the tools they need to become effective educators and learners. Significant emphasis is placed on the idea that how you teach is just as important as what you teach. Effective teaching and learning are paramount to success in all areas of physical therapy. **Audience:** Virtually everyone involved in physical therapy is included in the broad audience for this book. Whether you are a clinician, academician, clinical instructor, student, or just involved in physical therapy in some way, you will have the teaching-learning experience on a daily basis. **Features:** The book is divided into three distinct sections. The first explores who we are as individuals, how that impacts the teaching-learning experience, and what that means for us as educators. The second section examines the design, implementation, and assessment of effective instruction. The third section focuses on how learning takes place in the clinical setting. This book essentially practices what it preaches, presenting chapters with clearly written objectives, "Stop and Reflect" boxes, diagrams, bulleted "Key Points to Remember," and summaries to maximize learning. **Assessment:** Every physical therapist, physical therapist assistant, and student would find this book helpful. The knowledge they would gain would significantly increase the effectiveness of teaching-learning interactions that they have with patients, students, coworkers, and beyond. The book successfully highlights and expands upon many of the important points of APTA's clinical instructor certification course.

*Justin G Schaedle, PT, DPT, OCS
Butler County Physical Therapy*

Therapeutic Modalities in Rehabilitation, 4th Edition, McGraw-Hill Companies, 2011, \$85
ISBN: 9780071737692, 598 pages, Hard Cover

Editor: Prentice, William E., PhD, PT, ATC, FNATA

Description: This is the fourth edition of an instructional book on the rationale and practical application of therapeutic modalities in a rehabilitation setting. The previous edition was published in 2005. **Purpose:** The purpose is so provide students and clinicians with a comprehensive tool to understand the appropriate use of modalities in a clinical setting. It will help clinicians in select-

ing a suitable modality and applying it safely. It is imperative that therapists have a thorough understanding of this material because of the frequency and variety of modalities used in rehabilitation. The author does a nice job of explaining this material. **Audience:** The target audience includes anyone using modalities in a rehabilitation/healthcare setting, namely, athletic trainers, physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, physical therapy aides, and chiropractors. This would be an ideal book for students in any of these fields. The author has written numerous books and articles on this subject and is a leading instructor in the field. **Features:** The book covers the basic science behind the modalities along with the basis for their use. It describes electrical stimulation, ultrasound, iontophoresis, biofeedback, heat and ice, as well as lesser known modalities such as extracorporeal shockwave therapy, low level laser therapy, and diathermy. Other chapters cover interventions such as spinal traction and therapeutic massage. The book appears to have updated color photos and color charts, along with multiple case studies, glossaries, and learning activities at the end of each chapter. While the information is referenced nicely, most of it is based on theory and, therefore, this is not an evidence-based book demonstrating the effectiveness of the modalities used for specific conditions. **Assessment:** This is a comprehensive book designed for educating anyone using therapeutic modalities. It would be especially helpful to students in an academic setting because it provides a great deal of detail on a wide variety of modalities. This edition has been expanded, adding chapters on wound healing, electrodiagnostic testing, and extracorporeal shockwave therapy.

*Daniel Higgins, DPT, OCS, ATC
Orthopaedic & Sports Physical Therapy Associates*

Dutton's Orthopaedic Survival Guide: Managing Common Conditions, McGraw-Hill Companies, 2011, \$60
ISBN: 9780071715102, 1045 pages, Soft Cover

Author: Dutton, Mark, PT

Description: This is a consolidated, quick reference on orthopaedic physical therapy extracted from the author's 1,800 page Orthopaedic Assessment, Evaluation and Intervention, 2nd edition (McGraw-Hill, 2008). **Purpose:** The book is designed to enable novice readers to review foundational information such as anatomy, physiology, and biomechanics, and more experienced clinicians to easily reference a specific condition or test related to a particular patient. The author has done a very good job of consolidating the essential information from the main textbook in a handy lightweight book that is easy to carry and will be useful in the clinic or at home. **Audience:** It is intended for practicing clinicians as well as physical therapy students. As clinicians gain experience, there is a tendency to develop a specialty within orthopedics. This book is a great tool for experienced clinicians to use when they treat patients with conditions they do not see as often. It is also well organized and formatted to make it easy for any user to look up information very quickly. **Features:** The first of the book's two sections covers the fundamental aspects of orthopaedic physical therapy, while the second section has individual chapters that focus on different body regions, e.g. the hip and lumbopelvic complex. Each of these chapters is formatted the

same way for easy navigation through the material. Chapters start with an anatomy review, then move on to examination and evaluation procedures, treatment interventions, and, finally, common conditions for that region. This format reinforces material specific to conditions without making readers go through multiple resources looking for needed information. Important clinical points are bulleted for quick and easy reading. Numerous color tables and boxes throughout the chapters highlight pertinent information and clinical pearls. The only shortcoming is that many of the references are from before 2000. **Assessment:** Overall, this is a great contribution to orthopedic physical therapy. As a quick reference, it provides a considerable amount of information in a concise and easy to follow format for clinicians of any level of experience.

*Michelle Finnegan, DPT, OCS, MTC, FAAOMPT
Bethesda Physioicare*

Palpation Techniques: Surface Anatomy for Physical Therapists,
Thieme Medical Publishers, Inc., 2011, \$109.99
ISBN: 9783131463418, 397 pages, Hard Cover

Authors: Reichert, Bernhard, M, PT, MT, BSC PT; Stelzenmueller, Wolfgang

Description: Palpation techniques are an essential component of a physical therapist's education that are often bypassed, as they are difficult to teach. This English edition of a book originally published

in German does an excellent job of presenting this information in an easy-to-understand format. **Purpose:** It conveys the importance of proper and accurate palpation of anatomical structures on the human body for use in the practice of physical therapy. Audience: This book was written for a diverse audience that includes novice physical therapy students, experienced practitioners, and physical therapy educators. Each chapter, and the entire book, is organized to progress from easy techniques to more difficult skills. The author is a massage therapist and orthopedic physical therapist. **Features:** The book begins with a chapter on palpatory technique, and then covers specific regions of the body in each subsequent chapter (i.e., shoulder complex, neck and jaw, etc.). The photographs are excellent and multicolor skin drawings are frequently used to demonstrate underlying structures. The techniques are set up as foundational and to introduce therapists and students to higher level manual techniques. The anatomical basics of each body region are first discussed, as are pathology and mechanics. Then the emphasis moves to both stationary and movement-based palpation. **Assessment:** As an educator in a physical therapy program, I teach an applied anatomy class in which students are to learn basic palpation techniques. I have used a number of palpation references, but this one is the most useful. It is student and teacher-friendly for beginning students, but also imparts higher level information that students will use throughout their formal schooling and into the clinical setting.

*Amanda M Blackmon, DPT, OCS
Mercer University College of Pharmacy and Health Sciences*

2012 CSM Award Winners

The Orthopaedic Section awards ceremony was held on February 10, 2012 in Chicago, IL. Congratulations to all of this year's award winners.

OUTSTANDING PHYSICAL THERAPIST ASSISTANT STUDENT AWARD

The purpose of this award is to identify a student physical therapist assistant with exceptional scholastic ability and potential for contribution to orthopaedic physical therapy. The eligible student shall excel in academic performance in both the pre-requisite and didactic phases of their educational program, and be involved in professional organizations and activities that provide the potential growth and contributions to the profession and orthopaedic physical therapy.



Donald Glenn Trail, III of Lexington, Kentucky is currently a second-year PTA student at Somerset Community College (SCC). He holds a Bachelor of Exercise Science Degree from Saint Louis University, with a minor in psychology. He serves as Vice President of his class and of the SCC Physical Therapy Student Organization and, in these roles, has been highly visible on SCC's campus. He has been employed as a physical therapy technician at KORT Physical Therapy and at Cardinal Hill Rehabilitation Hospital in the past.

Active in his community, Trail has participated in many charitable projects. He has worked with children in many capacities, including coaching a little league baseball team and volunteering to assist with a flag football program for children with special needs. He serves as a peer mentor and tutor and has assisted with laboratory experiences for first-year physical therapist assistant students. He was recently featured in an inspirational story in the Lexington Herald-Leader that discussed healthy lifestyles and fitness, including a segment discussing Trail's

personal story of transformation through a weight loss of 55 pounds.

Trail has been highly active within the American Physical Therapy Association. He holds membership in the Orthopaedic, Research, and Neurology Sections and participated in an educational brochure design competition hosted by the Section on Geriatrics. He has attended two national conferences and met with legislators and aides in Washington, DC to advocate for physical therapy-related concerns. He has been published in the Kentucky Physical Therapy Association's newsletter and in the APTA's national student newsletter, the Student Assembly Pulse.

Upon graduation, he plans to relocate to the central Florida area with his wife, Sarah Catherine Downs Trail. Ultimately, Trail plans to further his education and obtain a Doctorate of Physical Therapy Degree.

He is the son of Don and Patti Trail of Lexington.

OUTSTANDING PHYSICAL THERAPY STUDENT AWARD

The purpose of this award is to identify a student physical therapist with exceptional scholastic ability and potential for contribution to orthopaedic physical therapy. The eligible student shall excel in academic performance in both the professional and pre-requisite phases of their educational program, as well as be involved in professional organizations and activities that provide for potential growth and contributions to the profession and orthopaedic physical therapy.



Sara Harvey is currently a third-year student in the Doctor of Physical Therapy program at West Virginia University, in which she has maintained a 4.0 grade point aver-

age. She also serves as the graduate assistant for the program, assisting the faculty with course instruction, as well as her fellow students through offering laboratory practice and tutoring outside of class. She is an active member of the American Physical Therapy Association, serving as the Student Assembly Core Ambassador for the state of West Virginia, as well as the APTA representative for her class. She is also a member of the Orthopaedic and Neurology Sections, as well as the West Virginia Chapter of the APTA. In her second year of study, Sara was awarded the West Virginia University Division of Physical Therapy Pathways Award and the Basic Sciences Award. In 2009, she graduated Summa Cum Laude with a Bachelor of Science degree in Exercise Physiology from West Virginia University.

During her undergraduate and graduate careers, Sara has also participated in many community service activities. These include participating in the West Virginia University and Barbour County Relay for Life, various activities with the children at the West Virginia University Children's Hospital, as well as mission work with the Haitians in the Dominican Republic and the homeless in Washington, DC. She and her classmates have also organized and participated in the WVU Trunk-Or-Treat during Halloween, provided Christmas gifts for children of families in need in the Morgantown community, participated in the WVU Dance Marathon fundraiser for the WVU Children's Hospital, and the Health South Mountainview Cranium Crawl 5K fundraiser for the Brain Injury Association of West Virginia. She recently organized a helmet safety program to educate children about traumatic brain injury and prevention during a local after-school program.

Sara is expected to graduate in May 2012. She plans to continue her professional development through assisting with instruction of the first-year gross anatomy course in the Department of Physical Therapy at West Virginia University. She then hopes to begin working in and making contributions to the field of physical therapy, while continuing her involvement with the APTA and other professional organizations at the state and national levels. She has

aspirations of one day working in physical therapy academia.

JAMES A. GOULD EXCELLENCE IN TEACHING ORTHOPAEDIC PHYSICAL THERAPY AWARD

This award is given to recognize and support excellence in instructing orthopaedic physical therapy principles and techniques through the acknowledgement of an individual with exemplary teaching skills. The instructor nominated for this award must devote the majority of his/her professional career to student education, serving as a mentor and role model with evidence of strong student rapport. The instructor's techniques must be intellectually challenging and promote necessary knowledge and skills.



J. Timothy “Tim” Noteboom, PT, DPT, SCS, is the 2012 recipient of the James A. Gould III Excellence in Teaching Orthopedic Physical Therapy Award. Dr. Noteboom is a Professor in the School of Physical Therapy at Regis University in Denver, CO. As a faculty member teaching in the entry-level physical therapy program as well as the postgraduate fellowship programs, Dr. Noteboom epitomizes the role of teacher, mentor, clinician, and researcher.

Tim Noteboom is an exceptional teacher and constantly strives to provide the most current and highest level of evidence available. As one of his colleagues noted, “He truly exemplifies what I define as a *teaching professor*.” By that I mean that he is one of those rare doctoral trained academicians who place effective classroom teaching as their highest priority.” Because of his departmental duties related to coordinating the Orthopaedic Manual Therapy Fellowship programs, he has also been able to emphasize the importance of postgraduate residency/fellowship training to entry-level students. Tim provides numerous opportunities for our entry-level students to interact with therapists in our orthopaedic fellowship program, which further stimulates their

interest. Tim has also been at the forefront of bringing technology into the classroom; and as a result, has been a recognized leader throughout our university and within the orthopaedic community on the use of audio-enhanced presentations and non-classroom web-based teaching models.

Both current and former students speak highly of Dr. Noteboom’s dedication and knowledge in the area of musculoskeletal physical therapy. One student states, “He is always available to provide learning opportunities outside of the normally scheduled classroom hours - be it online articulates, discussion forums, extra lab sessions, he does whatever he can to ensure his students are supplied with ample opportunities to learn.” Another former student writes, “Dr. Noteboom equips his students with life-long skills that go beyond a three-year physical therapy school education – he has not only been an outstanding teacher who has helped me to learn orthopaedic physical therapy, but he has also been an influential mentor throughout my time at Regis.”

It is obvious that Dr. Tim Noteboom is a most worthy recipient of the James A. Gould Excellence in Teaching Orthopaedic Physical Therapy Award. With this Award, Dr. Tim Noteboom joins a distinguished group of faculty and clinical mentors in orthopaedic physical therapy.

ROSE EXCELLENCE IN RESEARCH AWARD

The purpose of this award is to recognize and reward a physical therapist who has made a significant contribution to the literature dealing with the science, theory, or practice of orthopaedic physical therapy. The submitted article must be a report of research but may deal with basic science, applied science, or clinical research.



The recipient of the 2012 Rose Excellence in Research Award is **Dr. John Willson, PT, PhD**, for the manuscript: Gluteal muscle activation during running in females with

and without patellofemoral pain syndrome. *Clinical Biomechanics*. 2011;26:735-740.

John received his bachelor’s degree in biology from the University of Minnesota in 1996 and his master’s degree in physical therapy from the University of Wisconsin-La Crosse in 1998. Subsequently, John worked in outpatient orthopaedics for 5 years in Dodgeville, WI, Lexington, KY, and Newark, DE. In 2003 he began training for his PhD in biomechanics and movement science at the University of Delaware under the mentorship of Dr. Irene Davis. John completed his PhD in 2007 and is currently an assistant professor in the Physical Therapy Program at the University of Wisconsin-La Crosse where he enjoys teaching responsibilities in evidence-based practice, research methods, lower extremity evaluation and treatment, and instrumentation for human movement. His research is conducted with a collaborative group of faculty in the La Crosse Institute for Movement Science and is focused on identifying factors that contribute to knee injuries during running and other physical activities. He is an active member of the Orthopaedic, Sports, and Research Sections of the APTA.

RICHARD W. BOWLING – RICHARD E. ERHARD ORTHOPAEDIC CLINICAL PRACTICE AWARD

This award is given to acknowledge an individual who has made an outstanding and lasting contribution to the clinical practice of orthopaedic physical therapy as exemplified by the professional careers of Richard W. Bowling and Richard E. Erhard. Individuals selected for this award must have been engaged in extensive orthopaedic physical therapy clinical practice for at least 15 years and have positively and substantially affected the shape, scope, and quality of orthopaedic physical therapy practice.



Timothy W. Flynn, PT, PhD, is board certified in Orthopaedic Physical Therapy (OCS); a Fellow of the American Academy

of Orthopaedic Manual Physical Therapists (FAAOMPT); and a frequent research presenter at state, national, and international meetings. Dr. Flynn is widely published including 5 textbooks; 7 book chapters; and over 50 peer-reviewed manuscripts on orthopaedics, biomechanics, and manual therapy issues. Dr. Flynn has received numerous research grants. Awards include the James A. Gould Excellence in Teaching Orthopaedic Physical Therapy Award, the Steven J. Rose Excellence in Research Award (twice), the AAOMPT Outstanding Research Award (twice), and the Distinguished Alumnus-Marquette University Program in Physical Therapy. Dr. Flynn continues to maintain an active research agenda in the areas of spinal and extremity manipulation, low back disorders, characterization of spinal stability, and the development of clinical prediction rules.

Dr. Flynn is an expert clinician and owner of Colorado Physical Therapy Specialists. He is dedicated to providing the highest quality care possible. His primary clientele is made up of individuals suffering from low back pain, chronic spinal disorders, failed back surgeries, and chronic pain disorders. Dr. Flynn's clinical expertise is frequently sought by national and international clients. He is on the executive board of Evidence in Motion Institute for Health Professions, which passionately promotes a culture of evidence-based practice within the physical therapy profession. Dr. Flynn is the immediate past President of the American Academy of Orthopaedic Manual Physical Therapists and an Associate Editor for the *Journal of Orthopaedic & Sports Physical Therapy (JOSPT)*. He is currently a Distinguished Professor at Rocky Mountain University of Health Professions where he teaches and advises professional and postprofessional students in the area of musculoskeletal management, advanced manipulation skills, and health care research.

THE PARIS DISTINGUISHED SERVICE AWARD

The Paris Distinguished Service Award is awarded by the Orthopaedic Section to acknowledge and honor an Orthopaedic Section member whose contributions to the Section are of exceptional and enduring value. The recipient of this award is provided an opportunity to share his or her achievements and ideas with the membership through a lecture presented at this evening's Awards Ceremony.



The Orthopaedic Section's Paris Distinguished Service Award for 2012 is being presented to **Thomas G. McPoil, PT, PhD, FAPTA**. Dr. McPoil is currently a Professor in the School of Physical Therapy at Regis University. He is also an Emeritus Regents' Professor of Physical Therapy at Northern Arizona University and an Honorary Professor in the Division of Physical Therapy at The University of Queensland, Australia.

Dr. McPoil has served the Orthopaedic Section almost continuously since 1995. The positions that he has held within the Section include Founding Member and President of the Foot and Ankle Special Interest Group from 1995 to 1997 and from 1999 to 2001, Orthopaedic Section Vice President and Awards Committee Chair from 2004 to 2011, Member of the ICF-Based Clinical Practice Guidelines Advisory Panel from 2008 to 2011, and Vice President/Education Chair of the Foot and Ankle Special Interest Group (SIG) from 2011 to present. As the founder of the Foot and Ankle SIG, which was the Section's second SIG, Dr. McPoil helped to establish the procedures for creating a SIG that fostered the development of additional SIGs within the Section. During his tenure as Vice President of the Section, Dr. McPoil recognized the need to reform and streamline the SIG organizational structure to improve member participation and personally led the Section's efforts to create consistent policies and rules of order by which all SIGs and Educational Interest Groups (EIGs) abide. As a member of the Section's Board of Directors, Dr. McPoil represented the Section on the *Journal of Orthopaedic and Sports Physical Therapy (JOSPT)* Board of Directors. This included serving as the Member-At-Large from 2005 to 2006 and Treasurer from 2006 to 2009. During Dr. McPoil's tenure on the *JOSPT* Board of Directors, due in part to his leadership, a new agreement between the Orthopaedic and Sports Physical Therapy Sections was established. This new agreement stabilized the Journal and has enabled the *JOSPT* to continue to be one of the Orthopaedic

Section's most important member benefits.

As one of his nominators noted, "No one put more time and effort into serving the Section than Tom did during his tenure as Vice President. Tom was the Section's 'go to' person to manage the various trials and tribulations that we experienced." As another of his nominators so appropriately stated, "Tom is known as a consensus builder, effective communicator, and has provided clarity on many key issues related to administration of the Section office. He has made a difference in effectively guiding the Section to a more productive future."

In recognition of Tom's history of outstanding service and contributions to the Orthopaedic Section, it is most appropriate that Dr. Tom McPoil receive this prestigious Section Award.

OUTSTANDING RESEARCH POSTER AWARD

This award is given to recognize an outstanding Combined Sections Meeting research poster presentation.



This year's winner was **Stephanie Muth** (poster #2328) for her poster titled, Biomechanics and neuromotor effects of thoracic spine manipulation in subjects with signs of shoulder impingement.

Orthopaedic Section, APTA, Inc.

CSM Board of Directors Meeting Minutes February 8, 2012

James Irrgang, President, called a regular meeting of the Board of Directors of the Orthopaedic Section, APTA, Inc. to order at 6:00 PM CST on Wednesday, February 8, 2012.

Present:

James Irrgang, President
Gerard Brennan, Vice President
Steve Clark, Treasurer
Bill O'Grady, Director
Kornelia Kulig, Director
Lori Michener, Research Chair
Joe Donnelly, Practice Chair
Beth Jones, Education Chair

Guest:

Tom McPoil, Incoming Director

Absent:

Paul Rockar, APTA Board Liaison

Tara Fredrickson, Executive Associate
Terri DeFlorian, Executive Director

James Irrgang, President, welcomed Tom McPoil as the new incoming Director.

The meeting agenda was approved with modifications.

The January 24, 2012 Board of Directors Conference Call Meeting minutes were approved as printed.

CSM meeting dates, times, and locations were reviewed.

January – May 2012 Board of Directors conference call meetings – all begin at 8:00 PM EST ~

- Monday, March 12th
- Monday, April 9th
- Monday, May 14th
- Thursday, June 28-30th – 3rd Face to Face Board Meeting in La Crosse, WI

James Irrgang, President, reported there were no items on the consent calendar.

The following motions were adopted unanimously via E-mail and will be included in the minutes of this meeting ~

=MOTION 1= James Irrgang, President, moves that the Orthopaedic Section Board of Directors approve \$2,600 for a 2x run of the attached ad in the CSM Daily News onsite newspaper. The ad would run Thursday and Friday.

Fiscal Implication: \$2,600

Steve Clark, Treasurer, reported that the Section currently has 77.7% of its operating expenses in reserves.

James Irrgang, President, gave an update on the CSM review. The Section's comments were incorporated into the decision points. The total number of decision points ended up being 29. Approve, Responsible, Consult, Inform designations were assigned to each decision point. The next step will be to summarize the information and send back to the Sections. The next meeting will be scheduled in May 2012 to work on collecting the necessary information for each decision point. Finances will also be discussed at that meeting.

Steve McDavitt, Co-Chair of the PTA Advanced Proficiency Task Force, gave an update on where this is at with APTA. The Board agreed they needed more time to review the documents sent by Janet Crosier at APTA. A conference call will be scheduled in the next month with the Task Force and APTA.

James Irrgang, President, reported that the manual of operations for the National Orthopaedic Physical Therapy Outcomes Database has been completed by John Childs and Josh Cleland. The pilot study for database collection will be announced at the Section Membership Meeting on Friday. The data will be collected between April 1 and September 30. Data will be returned to the Section office where it will be entered into an Excel spreadsheet and then analyzed.

James Irrgang, President, reported that the Foundation for Physical Therapy has successfully raised \$350,000 needed for their referral for profit study. The Section has received a gift agreement from the Foundation for their donation to this study. The Board of Directors agreed language should be added to the agreement stating what the money would be used for if not utilized for the study.

=MOTION 2= Steve Clark, Treasurer, moved that the Orthopaedic Section Board of Directors add the following to the gift agreement with the Foundation for their referral for profit study, *"Money donated to the Foundation Referral for Profit study that is not utilized for the study will be used to offset the current Section contribution to the Foundation's Orthopaedic Endowment Fund."* ADOPTED (unanimous)

Fiscal Implication: None

A PTNow Portal Task Force meeting will be held at 1:00 PM on Friday, February 10th.

A Technology Task Force meeting will be held at 7:00 AM on Thursday, February 9th.

=**MOTION 3**= James Irrgang, President, as Liaison to the Membership Committee, moved that the Orthopaedic Section Board of Directors approve travel and 1 day lodging/meals for the Membership Vice Chair to attend CSM 2012. ADOPTED (unanimous)

Fiscal Implication: \$470 + \$285 = \$755

Beth Jones, Education Chair and Tara Fredrickson, Executive Associate, reported on the Section's Annual Meeting to be held in Orlando, FL the first weekend in May 2013. Members will be sent a 'save the date' postcard in the next few weeks. The Education Committee is working on the program and will discuss the proposed program with the Board on their March conference call.

Tess Vaughn, Education Vice Chair, reported that the availability of speakers is not coinciding with Mercer's availability for the regional psychomotor hip course. The Board agreed to put this on hold due to our upcoming annual meeting in 2013.

Lori Michener, Research Chair, stated there was nothing new to report at this time on the Clinical Research Network. A presentation will be given at the Section membership meeting announcing the research network. A call for pre-proposals will be sent to the membership with a deadline for submission in mid-April 2012.

=**MOTION 4**= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve a \$150 honorarium for each of the 12 members on the External Reviewer Grant Committee. POSTPONED INDEFINITELY (unanimous). The Board agreed to discuss this topic at their June face to face meeting in La Crosse for consideration of inclusion in the budget for 2013.

Fiscal Implication: \$1,800

=**MOTION 5**= Lori Michener, Research Chair, moved that the Orthopaedic Section Board of Directors approve the following research grants for 2012 –

- *“Cervical and Shoulder Manipulative Therapy Effects on Pain Sensitivity”*

PI: Rogelio A. Coronado, PT, CSCS, FAAOMPT

Co-Is: Steven George, PT, PhD; Mark Bishop, PT, PhD; Joel Bialosky, PT, PhD, FAAOMPT

Funding Request: \$15,000

Funding Category: NEW INVESTIGATOR

- *“Infraspinatus Activation in People with and without Rotator Cuff Tendinopathy”*

PI: Ann Harrington, PT, PHD, PCS, Post-doctoral Research Fellow

Co-Is: Philip McClure, PT, PhD, FAPTA; Scott Stackhouse, PT, PhD; Brett Sweitzer, MD

Funding Request: \$15,000

Funding Category: NEW INVESTIGATOR

- *“Multi-Component Rehabilitation after Total Hip Arthroplasty”*

PI: Dana Judd, PT, DPT

Co-I: Jennifer Stevens-Lapsley, PT, PhD

Funding Request: \$15,000

Funding Category: NEW INVESTIGATOR

- *“Trunk Coordination in Persons with Recurrent Low Back Pain”*

PI: Jo Armour Smith, PT, MManTh, OCS

Co-I: None

Funding Request: \$8,951

Funding Category: NEW INVESTIGATOR

- *“Validation of a Clinical Prediction Rule to Identify Patients with Shoulder Pain Likely to Benefit from Cervicothoracic Manipulation: A Randomized Clinical Trial”*

PI: Paul Mintken, PT, DPT, OCS, FAAOMPT

Co-Is: Josh Cleland, PT, PhD, OCS; Bob Boyles, PT, DSc, OCS, FAAOMPT; Kristin Carpenter, PT, DPT; Lori Michener, PT, PhD, ATC, SCS; Scott Burns, PT, OCS, FAAOMPT; Amy McDevitt, PT, DPT, OCS

Funding Request: \$25,000

Funding Category: UNRESTRICTED

ADOPTED (unanimous)

Fiscal Implication: None

Joe Donnelly, Practice Chair, reported that he is pursuing a possible motion related to involvement of Sections as content experts for all motions submitted to the House of Delegates. He will have an update on the March Board conference call.

=**MOTION 6**= Beth Jones, Education Chair, moved that the Orthopaedic Section Board of Directors approve providing 2 days lodging/meals at CSM for Jacob Thorpe, Education Committee Member, for his help during the conference. ADOPTED (unanimous)

Fiscal Implication: \$285 x 2 days = \$570

=**MOTION 7**= James Irrgang, President, moved that the Orthopaedic Section Board of Directors modify the existing policy in the ISC policies pertaining to term limits for contracted positions within the Section and include in the policies and contracts for all contracted positions; OP Editor, ICF Coordinator and RFC Coordinator. ADOPTED (unanimous)

Fiscal Implication: None

ADJOURNMENT 9:20 PM CST

Submitted by Terri DeFlorian, Executive Director

Orthopaedic Section, APTA, Inc.

CSM Board of Directors Meeting Minutes February 9, 2012

James Irrgang, President, called a regular meeting of the Board of Directors, Committee Chairs, SIG Presidents, ICF Coordinator and RFC Coordinator positions of the Orthopaedic Section, APTA, Inc. to order at 6:30 PM CST on Thursday, February 9, 2012.

Present:

James Irrgang, President
Gerard Brennan, Vice President
Steve Clark, Treasurer
Bill O'Grady, Director
Kornelia Kulig, Director
Lori Michener, Research Chair
Scott Davis, Research Vice Chair
Joe Donnelly, Practice Chair
Beth Jones, Education Chair
Tess Vaughn, Education Vice Chair
James Spencer, Membership Chair
Renata Salvatori, Membership Vice Chair
Chris Hughes, OP/ISC Editor
Eric Robertson, PR/Marketing Chair
Amie Hesbach, ARSIG President
Carrie Adamson, ARSIG Vice President/Ed Chair
John Garziona, PMSIG President
Julie O'Connell, PASIG President
Clarke Brown, FASIG President
Doug White, Imaging SIG President
Joe Godges, ICF Coordinator
Jason Tonley, RFE Coordinator

Guest:

Chris Bise, Member
Tara Jo Manal, PTNow Portal

Absent:

Tracy Brudvig, OSC Chair
Josh Cleland, Nominating Chair
Margot Miller, OHSIG President

Paul Rockar, APTA Board Liaison
Tara Fredrickson, Executive Associate
Terri DeFlorian, Executive Director

The meeting agenda was approved as printed.

James Irrgang, President, introduced Samantha Letizio, APTA Student Assembly Director and 2012 Liaison to the Orthopaedic Section.

James Spencer, Membership Chair, lead a discussion on possibly developing a student SIG within the Section. The Board agreed that

instead of a student SIG we should get students involved as members on our committees.

Chris Hughes, *OPTP* Editor, reported that *OPTP* has a new cover. There are also theme issues planned for this year. He stressed the importance of consistent SIG involvement in filling up their 4 newsletter pages each issue.

Chris Hughes, ISC Editor, reported that the 3rd Edition of *Current Concepts in Orthopaedic Physical Therapy* has been very popular. Topics and authors for 2014 courses will be brought to the Board of Directors for approval on the March Board conference call.

Eric Robertson, Public Relations/Marketing Chair, reported that our Facebook page is getting some postings. The SIGs have expressed an interest in having their own Facebook page but they are not currently putting enough information out to justify having separate pages at this time.

James Irrgang, President, asked for questions on the Orthopaedic Specialty Council report that was submitted by Tracy Brudvig, Chair. There were none.

Gerard Brennan, Vice President/Awards Chair, presented the list of the 2012 Section award winners. The winners were listed in an ad announcing highlights of the Section Membership meeting that was placed in the CSM on site Daily Newspaper. Other highlights included in the ad were the clinical research network, orthopaedic physical therapy outcomes database and the Section's 1st Annual Orthopaedic Section meeting.

James Irrgang, President, announced the Section's 2012 election results.

=MOTION 8= Joe Godges, ICF Coordinator, moved that the Orthopaedic Section Board of Directors approve Todd Davenport to replace Rusty Smith as an ICF advisory panel member. ADOPTED (unanimous)

Fiscal Implication: None

=MOTION 9= Joe Godges, ICF Coordinator, moved that the Orthopaedic Section Board of Directors approve appointing Phil McClure and Tony Delitto to another term as ICF advisory panel members. ADOPTED (unanimous)

Fiscal Implication: None

It was recommended that another survey to the membership should be done before the first revisions of the guidelines occur and include questions on the usefulness of the clinical practice guidelines and the ICF terminology.

Jason Tonley, Residency and Fellowship Education Coordinator, reported on the status of a business plan for residency and fellowship education as well as a testing database. Jason will gather more information and submit to the Board of Directors for discussion at their June meeting in La Crosse, WI.

Bill O'Grady, Director/Board Liaison to the OHSIG, reported that no action was taken at the OHSIG business meeting. They are still working on their revised application for specialization to resubmit to the ABPTS.

=MOTION 10= Clarke Brown, FASIG President, moved that the Orthopaedic Section Board of Directors create a task force to develop entry level foot and ankle curriculum content to be integrated into entry level PT programs. Curriculum will be completed by CSM 2013. Cost is estimated at \$20,000. ADOPTED (unanimous)

Fiscal Implication: \$20,000 – to be taken from FASIG encumbered funds.

=MOTION 11= Clarke Brown, FASIG President, moved that the Orthopaedic Section Board of Directors approve \$15,000 for a FASIG research grant in 2012. ADOPTED (unanimous)

Fiscal Implication: \$15,000 to come from FASIG encumbered funds.

John Garziona, PMSIG President, reported that the PMSIG is working to finalize topics and authors for a future ISC.

Julie O'Connell, PASIG President, reported that the PASIG is continuing to work on the content for their resource page located on the Section's Web site.

Amie Hesbach, ARSIG President, reported that their focus is on their practice analysis. They have also secured authors for an ISC.

Doug White, Imaging SIG President, led a discussion on allowing specific sections to appoint a liaison to the Imaging SIG. Doug will gather more information on this and bring back to the Board. There was discussion on whether or not the Section could appoint a non-physical therapist as a liaison to the Imaging SIG. More information is needed on this, so no decision could be made at this time.

ADJOURNMENT 9:30 PM CST

Submitted by Terri DeFlorian, Executive Director

Orthopaedic Section, APTA, Inc.

CSM 2012 Annual Membership Meeting Minutes Chicago, Illinois February 10, 2012

=FINAL=

I. CALL TO ORDER AND WELCOME

- A. James Irrgang, PT, PhD, ATC, FAPTA, President, called the meeting to order at 4:30 PM.
- B. Past Orthopaedic Section President's, newly certified orthopaedic specialists, all certified orthopaedic specialists, the Section Board of Directors, Committee Chairs, Chapter Liaisons, Student Assembly Liaison and Section Office Staff were introduced.
- C. A moment of silence was held for physical therapists that have passed away in the last year.
- D. The agenda was approved as printed.
- E. The Annual Membership Meeting minutes from CSM in New Orleans, Louisiana on February 11, 2011 were approved as printed.
- D. Orthopaedic Section Election Results were presented by Nominating Committee Member, Robert DuVall, PT, OCS, SCS, FAAOMPT.

For the 2012 election there were 1,027 ballots cast. The number of valid ballots was 1,027 and the number of invalid ballots was 0. The following individuals were elected: Treasurer, Steven R. Clark, PT, MHS, OCS; Director, Thomas G. McPoil, Jr, PT, PhD, FAPTA; and Nominating Committee Member, Cathy Arnot, PT, DPT, OCS, MTC, FAAOMPT.

There was a call for nominations from the floor for the 2013 election for the positions of President, Director and Nominating Committee Member. The following individuals were nominated for President – Amiee Klein and Tom McPoil. The following individuals were nominated for Director – Pam Duffy and Beth Jones. No nominations were brought forth for the position of Nominating Committee Member.

The deadline for accepting nominations for the 2013 election is September 1, 2012.

II. INVITED GUESTS

- A. *JOSPT* Editor-in-Chief, Guy Simoneau, PT, PhD, ATC, reported there were 92 manuscripts and 25 musculoskeletal imaging articles published in *JOSPT* in 2011. The impact factor is at 2.538. Currently *JOSPT*

is ranked number 5 of 43 among rehabilitation publications, number 9 of 61 in orthopaedic publications and 11 of 81 in sports publications.

- B. PT/PAC - Susan Appling, PT, PhD, OCS
- 2011
 - ✓ \$950,000 was raised.
 - ✓ \$584,000 was raised to support congressional candidates, PACs, and Political Parties.
 - ✓ More than 200 candidates or members of congress were supported.
 - 2011 PT-PAC Totals
 - ✓ There were 7,615 contributors.
 - ✓ The average contribution was \$124.83.
 - ✓ There was a 9.4% participation rate made up of 12.6% PTs, 4.3% PTAs. and 1.5% students.
 - CSM 2011 Section Competition
 - The Orthopaedic Section had 22.6% of their members contribute.
- C. William Boissonnault, President, Foundation for Physical Therapy, announced that the first award from the Orthopaedic Endowment Fund will be given out in 2014. The Foundation has also received the \$350,000 in commitments needed to begin work on the referral for profit study. The Orthopaedic Section will donate \$25,000 total over 2 years to the study.
- D. Tara Jo Manal, Co-Chair of the PTNow Portal with Judy Duetsch provided an update on the PTNow Portal. The PTNow Portal is in its beta stage and the presenters encouraged people to browse the site and provide feedback.

III. FINANCE REPORT - Steve Clark, PT, MHS, OCS

The year-end 2010 audit of the Orthopaedic Section's finances showed total assets of \$4,137,063 which is an 18.8% gain over 2009. 2010 audited income was \$1,615,314 and audited expenses were \$1,354,250 resulting in a profit of \$261,064. The unaudited income and expense figures for 2011 results in a profit of \$395,323. The total amount in the Section reserve fund (checking, savings, LPL investment fund) as of December 31, 2011 was \$1,411,444. The Section's encumbered fund including SIG funds and the restricted capital expenses was \$109,462. These encumbered funds are part of the total reserve fund amount. The 2012 operating budget is balanced with income and expenses both at \$1,718,804.

Operating expenses were 88% of the reserve fund at 2011 year-end. The Section's policy requires 40% to 60% of total operating expenses in the reserve fund. As of December 31, 2011 the total amount in the Practice, Research, and Education Endowment Fund was \$1,561,874. This is a total increase of 34.7% from the fund's inception in 2007. This includes a transfer of \$145,000 in January 2011, a deposit of \$200,000 in June 2011 and a transfer of \$100,000 in December 2011. There was a 3.7% gain on the LPL building fund value. The Section also still retains some land for the building of a footprint addition should this become a viable option. Currently the real estate market in La Crosse does not support expansion.

IV. SECTION INITIATIVES

- A. 2010-2014 Strategic Plan – James Irrgang, President
- The Section launched its new Web site design in January 2012.
 - The Section is partnering with the APTA on the development of a National Orthopaedic Physical Therapy Outcomes Database. A pilot program to collect and analyze outcomes data based on the Neck Pain Clinical Practice Guidelines will be released to the membership through Osteo-BLAST in March. The pilot program will consist of the following –
 - ✓ Development of paper-based data collection form
 - ✓ Volunteers will be solicited to participate in the pilot project. Each individual participating in the pilot project will be asked to collect data for 10 patients over a 6-month period from April 1st to September 30th, 2012.
 - ✓ A Manual of Operations and Procedures has been developed to standardize data collection.
 - ✓ Paper-based data collection forms will be submitted to the Orthopaedic Section office for data entry and analysis.
 - ✓ Feedback on clinical performance will be provided to those that submit data.
 - ✓ A survey will be conducted of individuals that participated in the pilot program to determine the burden of data collection and usefulness of information.
 - ✓ The results will be used to plan a computerized data collection & analysis system.
 - Lori Michener, Research Chair, announced that the Orthopaedic Section has established a \$300,000 grant to establish a Clinical Research Network (CRN). The network will engage Section members to participate in a multi-center clinical research study. A call for pre-proposals will go out to the members in March. The deadline for preliminary proposals is due to the Section office by April 16, 2012. If an applicant is invited to submit a full proposal, that will be due on July 16, 2012. The start date will be no sooner than December 15, 2012.
 - Mark your calendars for the 1st Annual Orthopaedic Section Meeting. The date will be May 2-4, 2013 in Orlando, Florida. Watch for more information to come!

- B. ICF-based Clinical Practice Guidelines for Common Musculoskeletal Conditions – Joe Godges, Coordinator
- Workgroups include cervicothoracic spine; shoulder; elbow, wrist and hand; lumbrosacral spine; hip; knee; foot and ankle.
 - Published Clinical Practice Guidelines include: Heel Pain – Plantar Fasciitis (2008); Neck Pain (2008); Hip Pain and Mobility Deficits/Hip Osteoarthritis (2009); Knee Stability and Movement Coordination Impairments/Knee Ligament Sprain (April 2010); Knee Pain and Mobility Impairments/Meniscal and Articular Cartilage Lesions (June 2010); Achilles Pain, Stiffness and Muscle Power Deficits/Achilles Tendinitis (September 2010).
 - Clinical Guidelines in progress: Low Back Pain, Shoulder Pain and Mobility Deficits/Adhesive Capsulitis, and Non-arthritic Hip Disorders.
 - Potential Future Clinical Guidelines: Elbow Epicondylitis, Carpal Tunnel Syndrome, Hip Fracture, Lateral Ankle Sprain, Shoulder Rotator Cuff Syndrome, Shoulder Instability, Patellofemoral Pain, Knee Osteoarthritis, Anterior Cruciate Ligament Injuries: Prevention and Rehabilitation and Throwing Injuries to the Shoulder and Elbow: Prevention and Rehabilitation.
 - Open access to published Clinical Practice Guidelines can be found at www.jospt.org.
 - Section members were invited to visit orthopt.org to give feedback on the clinical practice guidelines.
- C. Residency and Fellowship Education (RFE) Committee – Jason Tonley, Coordinator
A business plan for residency and fellowship education including an electronic testing database is being developed. The Board of Directors plans to review the plan at their March meeting.

V. PROPOSED BYLAW AMENDMENTS

The following amendments to the Section bylaws were approved by the membership in December 2011:

- **ARTICLE VI. MEMBERSHIP MEETINGS**
Section 3: Notice of Meeting Requirements

Notice of time and place of **Annual and any Special Membership business** meetings shall be sent to all Section members at least thirty (30) days prior to the meeting.
- **ARTICLE VII. BOARD OF DIRECTORS & OFFICERS**
Section 1 G: Meetings and Conduct of Business

1. Regular Meetings
The Board of Directors shall have ~~three regular~~ a **minimum of two (2) face-to-face** meetings each year: **a winter meeting, a summer meeting, and a fall meeting**. If the Association has a Combined Sections Meeting, the Board's winter meeting shall be held in conjunction with it. The time and place of each

regular meeting shall be determined by the Board.

- **ARTICLE X. DELEGATE TO THE ASSOCIATION'S HOUSE OF DELEGATES**

- **Section 1:Qualifications**

- A. Only Physical Therapist and Physical Therapist Assistant members who have been members of the **Association Section** in any category of membership in good standing for two (2) years immediately preceding may serve as a Section Delegate.

- **EDITORIAL CHANGES**

1. Regional and Special Interest Groups – **Changed to Special and Educational Interest Groups.**
2. Executive Director, **NOT the Vice President**, shall keep the minutes of meetings.
3. Principle Officers – **changed to Board of Directors.**
4. All references to Business Meetings - **changed to Membership meetings.**

- **EDITORIAL CHANGES** under ARTICLE XI. ELECTIONS

1. The slate of candidates shall be published **on the Orthopaedic Section Web Site** and **NOT in OPTP.**
2. The Nominating Committee will present its selections in **an October (NOT September)** mailing to all voting members **and post on the Section Web Site.**

VI. RECOGNITION

The following outgoing officer and committee chair were recognized for their service to the Section as their terms end at the close of the 2012 CSM Membership Meeting –

- Kornelia Kulig, PT, PhD – Director
- Joshua Cleland, PT, PhD, OCS – Nominating Committee Chair

VII. NEW BUSINESS MOTIONS

No motions were brought forth from the floor.

VIII. OPEN FORUM

Discussion was brought forth from the floor regarding the Federation of State Boards proposal to include joint mobilization on the national physical therapy assistant examination. This addition is based on a recent Entry-Level Practice Analysis Update for Physical Therapists Assistant Licensure Examination Offered by the Federation of State Boards of Physical Therapy. It was suggested that the Orthopaedic Section closely evaluate this proposal to add joint mobilization to the national physical therapist assistant examination.

Board of Director, Committee, ICF, Residency and Fellowship Education, SIG and EIG reports are all located on the Orthopaedic Section Web site (www.orthopt.org).

ADJOURNMENT 5:45 PM

OCCUPATIONAL HEALTH

SPECIAL INTEREST GROUP

GREETING OHSIG MEMBERS!

APTA Combined Sections Meeting took place Feb 8-11, 2012 in Chicago IL. More than 12,000 PTs/PTAs/students and others attended! It was a great opportunity for networking and learning.

Occupational Health Special Interest Group (OHSIG) programming featured speakers included Dee Edington, PhD; Joannette Lima, CPE, PT; and Cory Blickenstaff, PT, OCS.

INTRODUCTION

A culture of wellness at job sites—including every physical therapy practice setting—benefits individuals, society, and corporate health. Starting with their own workplace, PTs have a unique opportunity to assist industry in the creation of a healthy and high-performing workforce. Conclusions from longitudinal studies encourage a change from the illness/injury model to one that promotes and gives incentives for wellness. This session examined the evidence-based, transformational approach to creating a healthy and high-performing workforce. The speakers addressed how individual health promotion, organizational environments, and workplace cultures impact health care cost containment, disability, productivity, and human resource development. The PT's role in this novel approach was explored by therapists currently working with industry.

Dee Edington's presentation focused on "Partnering with Business to create a healthy, high performing workforce... Changing the Conversation from Injury Management to Wellness Activities: Health Promotion in your Practice Setting and on the Job Site."

Edington is a pioneer in wellness and the director of the University of Michigan Health Management Research Center. His book "Zero Trends: Health as a Serious Economic Strategy" examines ways employers can head off health insurance cost increases by targeting risk factors and overall systems instead of individual defects.

In an enlightening presentation, Edington discussed how the business community is what is driving the change in how we view health care, because they have to. They are the only ones in this country that benefit from people being well and healthy. Everyone else benefits from people being sick! Our whole health care system is founded on waiting until people get sick and then treating them. We need to reverse this, to fix the systems that lead to the defects. That's what wellness is about, trying to avoid the defects. Edington goes on to say that employers are tired of paying for sickness. They want to pay for wellness—they understand that no company is going to be successful going forward in this competitive world without healthy, productive people.

The second part of the programming featured two physical therapists who work in industry toward keeping workers healthy and productive: "Changing the Conversation from Injury Management to Wellness and Health Promotion in your Practice Setting and at the Job Site." Joannette is the safety services manager for Disneyland. She discussed her role in ergonomics for Disneyland. Cory is a WorkWell Quality Provider who works with industry directly providing onsite services. Joannette and Cory presented a thought provoking discussion on partnering with business to create a healthy, high performing workforce.

We thank Dee, Joannette, and Cory for their insightful presentations!

Following the OHSIG Programming, the OHSIG Business Meeting took place. Current OHSIG officers include:

Margot Miller, President
Lorena Pettet Payne, VP/Ed Chair
Sandy Goldstein, Communications Chair
Kevin Svoboda, Membership Chair
Rick Wickstrom, Payment Policy Chair
Kathy Rockefeller, Research Chair
Jill Galper, Nominating Chair
Nicole Matoushek, Nominating Committee (newly elected)
John Lowe, Nominating Committee (newly elected)

The OHSIG BOD meeting took place at CSM as well. All members were present. Karen Jost, Associate Director Payment Policy & Advocacy at APTA, attended the meeting. She presented a draft agenda for workers' compensation payment policy advocacy. She asked for assistance from the OHSIG as she moves forward with the agenda as a benefit to members. Karen presented a preliminary review of work comp regulation across the United States. The APTA Payment Policy is joining in the conversation regarding "Place of Service" codes, which the OHSIG assisted with.

The strategic plan was revisited with a couple of revisions made.

The OHSIG Bulletin Board, which is not being used by members, was discussed. The Board's focus is to meet the needs of current and prospective OHSIG members by disseminating information and encouraging discussion among members. We will continue to explore a networking venue that is accessible, cost neutral, and serves the needs of the membership.

Rick Wickstrom discussed the power point that he developed including information on OHSIG developed FCE Guidelines, Defensible Documentation, and Advanced Work Rehab Guidelines. If you are interested in presenting this at a State Chapter level, contact Rick at rick@workability.us.

The office of OHSIG President is up for election later this fall. The term is 2013-2016. If you are interested in running, contact Jill Galper, Nominating Committee Chair at Jill.Galper@imxmed.com.

As always, your BOD members are listed on the Web site. We welcome your feedback!

*Professional Regards,
Margot Miller, PT
OHSIG President*

THE IMPACT OF OUR AGING WORKFORCE: HOW PHYSICAL THERAPY PROFESSIONALS CAN IMPROVE THEIR OUTCOMES

By Nicole Matoushek MPH, PT, V.P. of Product Development at Align Networks, she has nearly 20 years of experience in the Physical Therapy/Workers' Compensation industry; she can be reached at nmatoushek@alignnetworks.com or www.alignnetworks.com

As physical therapy clinicians, it is always important for us to evaluate the demographics and characteristics of our patient population. This is a critical function in care and treatment planning, as well as in managing our outcomes metrics. In the Workers' Compensation industry, this becomes even more important as we facilitate the safe and appropriate return to work of aging injured workers.

We are all familiar with some of the general effects of the aging body. In fact, many of us groan as we see these changes in our own bodies. Yet, this is not all bad, as someone told me the other day: "quit complaining about getting older, it is a privilege many are denied." Just as at times we need to adjust our mental perspective, at times we need to adjust our therapy focus to better fit the aging population. As therapy professionals, we can absolutely make a positive impact on the health, the abilities, and general well-being of our older workforce. Let's first look at some of the important trends and changes in human physiology that affect the aging workforce, so that we can modify and optimize treatments and expectations to produce a win-win outcome for all.

Aging Workforce & Injury Trends

The aging workforce is defined as those individuals aged 55 and higher. Currently, this part of our workforce consists of a higher proportion of the overall workforce, reflecting 19% of the workforce in 2009, up from only 12% of the overall workforce in 2003. Many of these folks continue to work past the traditional retirement age due to both financial and personal reasons. When we look at financial impacts, we see that the economic recession, the invention of 30-year mortgage, and higher overall living costs have all been linked to the growth of the aging workforce. Additionally, people are living longer and they desire a more active lifestyle, a lifestyle that continues to challenge them both physically and mentally. This fact is also shown to be correlated to the increase in the percentage of people foregoing retirement until later years.¹

Next, when we examine work-related absences following a

work-related injury, we see two things; that longer durations of work absences steadily increase with age, and the median number of lost work days after injury increases with age.² When we examine various injury trends of this 55+ demographic of our workforce, we find some interesting facts that can help us develop more focused treatment and injury prevention plans. First, we find that the most frequently injured body parts are the following: ankles, wrists, arms, fingers, and hips. Second, when we evaluate the mechanism of injury causing or contributing to the injuries of our aging workforce, we find the most common means of injury is due to falls. After fall frequency, we find that overexertion and contact with an object are the next most common ways older workers are getting injured. When we examine the conditions and types of tissues that appear most susceptible, we see that most of the injuries are strains, sprains, or soft tissue injuries. However, we do see a higher incidence of fracture rates in this population, which may correlate to the higher fall risk noted above. We also tend to find more patients with multiple injuries and also more co-morbidities present. All of these factors may contribute to delayed healing, longer recovery times, and extended episodes or durations of therapy and may also explain the longer absences and time away from work.³⁻⁵

What & How Injuries Happen in the Workplace

In your physical therapy practice, if you treat injured workers, young or old, it is important to gain an understanding of how and why these workplace injuries occur. This insight will advance your clinical skills and help you to provide more efficient, goal directed treatment plans that focus not only on functional improvement, but also on the prevention of additional injury and general well-being. Typically, workplace injuries occur due to two primary mechanisms—force-related and cumulative trauma and exposure to ergonomic risk hazards.

With direct force related injuries, we have to go back to our college physics course and recall our lessons on force. Forces have characteristics such as speed, size, and direction. When a force is directly applied to a body, the energy must be absorbed, deflected, or returned. Recall the physics Law, the Law of Motion & Energy: *Energy cannot be created or destroyed, but it can change in form or be absorbed.* This means in instances where we have force related injuries, such as a fall, getting struck by an object, a bodily reaction injury or even a deceleration injury, the mechanism of injury is all about that transfer of energy. In these types of motion injuries, the injury is caused by the body's absorption of potential or kinetic energy: falls (potential/gravity) and hit by object (kinetic energy). In fact, a deceleration injury, such as from a motor vehicle accident is also a result of the body absorbing energy. Generally, the severity of the injury depends on the size, speed, and direction of the force applied.

Next, we have cumulative trauma or exposure injuries. We typically classify these as ergonomic-related injuries. Clinically, ergonomic work-related injuries occur when there is inadequate blood flow or tissue recovery time due to work cycles or exposure to ergonomic risk factors. In these injuries, tissue damage can lead to inflammation, degeneration, loss of function (ROM, strength), impairment, and even disability. The injury types are commonly called: overexertion injuries, repetitive strain injuries, or cumulative trauma disorders. The key is

that these injuries occur over time, with repeated exposure to specific ergonomic or safety risk factors. Traditional ergonomic risk factors are listed below:

- Forceful exertion
- High repetition
- Awkward postures/working outside of “optimal” or neutral joint postures
- Sustained postures
- Contact stress
- Personal protective equipment (PPE)/Gloves: *Increase grip needed by 10%*
- Shift work/schedules/over time requirements

Physiological Changes on the Human Body Related to Aging

This section provides an outline of the specific physiological changes that occur to the human body as it ages. In regard to functional deficits a Physical Therapist can address, we will focus on these primary areas of concerns:

- 1) Bones & Joints
- 2) Eyes
- 3) Metabolic/Co-morbidity
- 4) Vascular Changes
- 5) Dehydration
- 6) Functional Abilities

For each physiological change, some key factors that may impact worker safety and/or performance will be included.^{6,7}

Age Related Changes: Bones & Joints

The weight bearing and movable joints have the highest risk for age-related degenerative changes. In fact, we see a much higher risk for osteoporosis and osteoarthritis in our older population; this risk increases significantly over the age of 40. We see less synovial fluid in the joints, less flexibility of contractile tissues, and more compression of joint surfaces. Clinically, we see losses of ROM, flexibility, and strength, accompanied by a higher fracture risk for the spine, hips, wrists, and ankles.

Impact on Work:

In the workplace, for our aging workforce we observe these trends due to changes in the bones and joints:

- Poor/awkward postures
- Higher risk for cumulative trauma disorders
- Slower tissue recovery rates
- Painful, slower movement, lower productivity
- Higher fall risk, 1/3 of all 65+ population fall each year

Eyes: Age Related Vision Problems

Almost everyone experiences changes in their eyesight as they age. Visual accommodation begins to weaken at around age 40, forcing many to use bifocals or increase their eyewear prescription. Additionally, macular degeneration and cataracts begin to appear at age 50. Below are some common visual impairments related to age-related vision changes:

- Loss of visual accommodation, acuity & contrast: age 40+
- Presbyopia: loss of ability to see close objects; corrective lenses, bifocals: age 60+
- Retinal damage, diabetics
- Loss of lateral visual field

Impact on Work

These visual changes and impairments may affect the aging worker in performing his or her duties safely.

- Poor/awkward postures to accommodate, increased muscle strain, injuries, degenerative joint/disc diseases
- Increased eye strain/dryness
- Reduced ability to see safety warnings
- Higher injury risk due to limited vision

Metabolic: Age Related Changes

The aging population also sees a higher incidence of metabolic related co-morbidities and their associated diseases. Clinically, we can see this manifest in our patient population as muscle weakness, fatigue, dizziness, or other side effects due to specific medications. Certain metabolic conditions come with a higher risk for type 2 diabetes, heart disease, stroke, and other vascular changes. In fact, 40% of adults ages 40 to 74 have pre-diabetes signs. Additionally, we are also seeing our population is getting heavier, with higher body fat/BMI and their associated adverse health effects.

Impact on Work:

This can impact the aging worker with higher injuries rates and slower recovery times.

- Fatigue, weakness, higher musculoskeletal injury risk
- Higher fall risk
- Delayed healing postinjury
- More lost work days postinjury
- Age-related diseases/co-morbidity rates increase

Vascular: Age Related Changes

Aging causes several changes to our vascular system that will ultimately affect our endurance and aerobic capacity. As stated above in the ‘how do work injuries happen section,’ cumulative trauma disorders are a result of inadequate blood flow based on work-recovery times. Based on the physiologic changes cited below, the older population and aging workforce may be working harder to accomplish less. As we age, arteries stiffen resulting in higher blood pressures. We see a diminished ability to regulate our heart rate, with resultant diminished peripheral blood flow. Specific deficits may include:

- Oxygen exchange – 40% lower at 65 years
- Respiratory system – 25% less at 65 years, 50% less at 70 years
- Cardiovascular system – 15% to 20% less at 65 years

Impact on Work:

The impact on the aging worker relates to the diminished recovery time with workloads or postinjury.

- Deconditioned, poor activity tolerance, slower recovery rate, fatigue
- Higher injury, slower recovery

Dehydration: Getting Older, Getting Drier

As we get older, we lose a significant amount of water from our tissues. In fact, look at the changes of the percent body water composition during certain life stages:

- Newborn: 90%
- Young adult: 70%

- Elderly person: 50%-60%

As we get older, we truly do get dryer, which affects tissue elasticity and chemistry. Optimal function, even at a cellular level, requires sufficient water composition. Physical decline can be lessened and tissue healing can be enhanced with proper hydration. Clinically, we understand that dehydration can manifest into light-headedness, dizziness, muscle weakness, loss of attention, and fatigue. This can affect how a person performs in the clinic as well as at work.

Impact on Work:

The impact on the aging workforce relates to higher risk for injury due to slower recovery times.

- Slower musculoskeletal recovery times, higher injury risk
- Use of PPE or extreme heat can worsen
- Reduced productivity

Functional Changes: Age Related

Diminished muscle strength, flexibility, coordination, reflexes, balance, loss of range of motion, and general deconditioning are all clear signs of the body progressing in years. Below you will find significant deficits in these measures of function:

- Strength: 25%-30 % lower at 65 years
- Flexibility: 18%-20% decrease at 65 years
- Reaction time & speed: decreases
- Manual dexterity & tactile feedback: motor skills deteriorate
- Grip Strength: decreases 40% by age 55

Clinically, we also tend to observe a higher incidence of co-morbidities with pathophysiological affects: diabetes, heart disease, circulatory problems, nervous system, and other conditions. These conditions may worsen levels of function even more due to direct assault on tissues by specific disease states. Lastly, the aging population also tends to take more medications than the younger population. Many of these medications have side effects that directly impact the level of function or impair the level of function, such as changes in heart rate, dizziness, nausea, blurred vision, etc.

Impact on Work:

The impact on the aging workforce may relate to their fall risk and the need to secure more sedentary positions:

- Safety & injury risk: falls!
- Less physically demanding jobs

Prevention: Wellness & Education

As physical therapy professionals, we have a strong presence and professional responsibility to assist in the general wellness, education, and injury prevention for the aging population. Points of focus may include educating and encouraging our older patients to participate in wellness programs. For example; encouraging them to get regular check-ups for dental, eye exams, and physician exams; participating in a regular exercise program; and the importance of proper diet and hydration. Another point of focus may be to include education on home safety in an effort to reduce the risk for falls. Examples of home safety tips may

include the following: educating on the need to have well lit walk-ways and hallways; to have slip resistant floor surfaces in their home; and to remove trip hazards such as electrical cords and area rugs.

When preventing injuries in the workplace for the aging population, reducing fall risk is a priority. Programs that include pre-screening and matching the abilities of the worker to the physical demands of the work tasks help to ensure safety and minimize injury risk. If an injury occurs, then a post-therapy, work conditioning program may be appropriate to help the aging worker safely transition physically back to performing full work duties. Lastly, ergonomics programs at the worksite can help ensure workplace safety by analyzing body mechanics and changes in posture due to the aging body. These programs can offer ergonomic adjustments to workstations, identify alternate equipment solutions that will reduce joint stress or modify work cycles for the aging population.

PT Management of Injuries: Aging Patients

As physical therapy professionals, we have a responsibility to provide medically necessary care and customize our treatment plans based on the needs of the individual patient. With an aging patient, we may need to recall how the aging process affects the human body, and that these affects can influence how our patients comprehend, see, or follow our exercise prescriptions. For example, an aging patient who may suffer from visual loss may require an exercise sheet with larger print and images, or additional written instructions. An older patient who has a loss of hearing may require more verbal cueing. As therapists, we should focus our treatment plans to address the bone and joint degenerative changes, the loss of muscle strength, and tissue atrophy. Finally, we should acknowledge the potentially slower tissue recovery times due to both metabolic and cardiovascular changes, and modify exercise prescriptions according to individual patient needs. We should then provide written documentation, and offer clinical rationale for any extensions of therapy that may be required beyond the recommended clinical guideline. It is important to address these slower tissue recovery times in treatment plans as well as in documentation.

Key Summary Points from this Article

(1) Understanding the trends of the aging population, including the aging workforce, and how workplace injuries occur is critical to effectively managing therapy plans and outcomes.

(2) It is important to recognize the changes in the human body as it ages. Additionally, it is important to understand how these changes in the human body can impact one's health, physical therapy clinical care, and ultimately on physical therapy outcomes.

(3) When treating patients in this older workforce, physical therapy treatments should focus on both prevention and injury management. Treatments should include directives towards functional gains, safety in the workplace and at home, and also emphasize return to work.

(4) Episodes of therapy care may be extended in the older population due to physiological changes, injury type, and/or co-morbidities. In these instances, the continuance of therapy care should always be supported with objective clinical documentation.

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IMAGING

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

Having just returned from CSM in Chicago we are excited and invigorated. The imaging programming at CSM was outstanding. Conference attendees had opportunities to learn musculoskeletal ultrasound imaging (USI), MRI application in understanding the effects of whiplash, and participate in our forum on USI and scope of practice. A big Thank You to all the speakers!

The Imaging Special Interest Group (ISIG) held its first business meeting that was attended by ~50 people, a great turnout. We had many individuals express interest in working on ISIG activities and we have ambitious plans. The ISIG adopted the following activities for 2012:

IMAGING SPECIAL INTEREST GROUP 2012 ACTIVITIES

- Recruit Members to the ISIG
- Add content to ISIG area of Section Web site
- Work with the Orthopaedic Section on implementation of social media for the ISIG
- Assist APTA with development of practice guidance for USI
- Promote standardized imaging terminology
- Establish a Research Committee
- Education Activities
 - o Solicit programming for CSM 2013
 - o Explore developing an Independent Study Course on Imaging
- Develop curriculum guidance for imaging in PT education

WE ARE GROWING! JOIN US!

The NEW Orthopaedic Section's Imaging Special Interest Group (ISIG) is growing! We are excited that so many individuals have joined our new SIG in such a short period of time. Please join the Imaging SIG by sending an E-mail to Tara Fredrickson at tfred@orthopt.org.

WELCOME TO NEW NOMINATING COMMITTEE MEMBERS

Please welcome Dr. James Elliott and Dr. Judy Woehrle to the ISIG Nominating Committee.

PERFORMING ARTS

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

We are coming off a great CSM 2012 in Chicago. A big thanks goes out to our speakers Mary Massery, Jeff Stenback, and Amy Humphrey on a job well done on our programming: "The Core of the Matter: from the Hips to the Lips." I am excited about the direction of the PASIG for 2012. Please go to our Web site at www.orthopt.org and fill out your member profile. This is a great way to get connected with other PASIG members across the country.

Please visit the resource page located on the Web site and provide feedback to me at joconnell@athletico.com regarding the content so we can address the members desires. We are actively seeking participants who are interested in providing content for the resource page. For those of you who were at CSM, you should be getting an E-mail from the committee leader about your potential involvement in this process. Please remember to respond to this E-mail and help us generate material to share with other PASIG members on this resource page.

We welcome Annette Karim, PT, DPT, OCS, as the new Research Chair. She is actively seeking authors for the monthly citation blasts. If you are interested in helping with the blast, please E-mail Annette at neoluvsonlyme@aol.com.

We were happy to award our student scholarship to Rachael Billingsley from Wayne State University. Her poster presentation was entitled "Rehabilitation of a 27-year-old Ballet Dancer Post Periacetabular Osteotomy: A Case Study." If you are interested in submitting an application for the 2013 student scholarship, please contact the student scholarship chairperson, Amy Humphrey at amy@lancasterpt.com.



This is a photo of Rachael Billingsley (left) and Amy Humphrey (right).

We welcome Laura Becica, PT, DPT, as the new Nominating Committee Chair. We are actively seeking nominations for the Vice President position and a Nominating Committee member position. If you are interested in running for either of these positions or nominating a member, please contact Laura at lbecica@physioarts.com.

Sincerely,
Julie O'Connell, PT, ATC
PASIG President

PERFORMING ARTS CONTINUING EDUCATION



Performing Arts

Independent Study Courses

Orthopaedic Section Independent Study Course.

20.3 Physical Therapy for the Performing Artist

Monographs are available for:

- Figure Skating (J. Flug, J. Schneider, E. Greenberg)
- Artistic Gymnastics
(A. Hunter-Giordano, Pongetti-Angeletti, S. Voelker, TJ Manal)
- Instrumentalist Musicians (J. Dommerholt, B. Collier)

Orthopaedic Section Independent Study Course.

Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers

This is a 6-monograph course and includes many PASIG members as authors.

- Epidemiology of Dance Injuries: Biopsychosocial Considerations in the Management of Dancer Health (MJ Liederbach)
- Nutrition, Hydration, Metabolism, and Thinness (B Glace)
- The Dancer's Hip: Anatomic, Biomechanical, and Rehabilitation Considerations (G. Grossman)
- Common Knee Injuries in Dance (MJ Liederbach)
- Foot and Ankle Injuries in the Dancer: Examination and Treatment Strategies (M. Molnar, R. Bernstein, M. Hartog, L. Henry, M. Rodriguez, J. Smith, A. Zujko)
- Developing Expert Physical Therapy Practice in Dance Medicine – (J. Gamboa, S. Bronner, TJ Manal)

Contact the Orthopaedic Section at:



Or call 1-800-444-3982

PAIN MANAGEMENT

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

The Combined Sections Meeting this year was another attendance record breaker with a projected 12,000 people attending. The programming was excellent, as usual, and I want to again personally thank Beth Jones and the Education Committee for their fine work. Also Terri DeFlorian and Tara Fredrickson at the Section office, as well as the Orthopedic Section BOD always go above and beyond to continue to make this meeting a huge success.

The SIG business meeting minutes can be found below.

Our program, "Chronic Pain: Myths, Measures, and Management" presented by Dana Dailey and Kathleen Sluka was well received by the 600+ attendees. I thank Dana and Kathleen for their informative presentation that will add to our knowledge of how to best understand and treat our patients who have persistent pain.

The following article describes an innovated program that one of our members is using to address the often overlooked aspect of persistent pain. I am happy to have Carolyn McManus describe her program.

I hope you have a wonderful spring.

*John Garzione
PMSIG President*

PAIN SIG MEETING MINUTES CSM 2012 CHICAGO, IL

Friday February 10, 2012

The meeting was called to order at 11:40 AM by John Garzione, President.

Last years' minutes were published in *OPTP* and approved.

All involved with SIG activities were thanked for their participation over the past year. Continued thanks go to Joel Bialosky, Research Chair, for his contributions to the quarterly E-mail blasts. The members of the ISP task force, Marie Hoeger Bement, Kathleen Sluka, Laura Frey-Law, John Ware, and Neena Sharma, were also thanked.

It is not too early for members to think about running for office in the SIG. The President's position ends at the end of CSM 2013 and the Vice President ends in 2014. Interested people can contact the Nominating Committee, Neena Sharma or Bernadette Jaros.

We still need more articles for the *OPTP* newsletter, which can be E-mailed to johngarzione@frontiernet.net for submission. The SIG must have at least two articles per year published in *OPTP*.

Discussion was held about the revised ISP topics and John G. will arrange for another conference call with the task force to finalize topics, authors, and readers to be submitted. Many

members expressed an interest in getting involved with the ISP.

The PMSIG will help sponsor member Anita Davis to the CARF International Standards Advisory Committee.

NEW BUSINESS:

1. We will try to re-vamp our Web page to include member's area of interest, location, etc. Unfortunately the Web site is not set-up to allow us to search by region.
2. The PMSIG will be investigating entry level curriculum for pain education. Marie Hoeger Bement will look into a survey to determine what is being taught.

A suggestion was made to adopt the term "persistent pain" instead of "chronic pain" for our patients.

There was discussion about our educational programming in the future. The group expressed an interest in having two hours of regular programming with an additional hour for presentations of treatments and investigations from different clinicians with an interactive session.

The meeting was adjourned at 12:35.

*Respectfully submitted,
John Garzione, President*

TEACHING PATIENTS ABOUT PAIN IN AN INNOVATIVE CLASS FORMAT

Carolyn McManus, PT, MS, MA

In the fall of 2010, the medical director of pain service at Swedish Medical Center in Seattle asked me to develop a pain neurophysiology patient education class for our patients with chronic pain. As I already knew that educating patients during individual treatment sessions reduced fear and increased motivation, teaching this material in a group seemed like a great next step. Having also taught many types of patient education groups in the past, I knew the power of getting people together to share stories and ideas.

After a review of the current literature, I developed a program that meets once a week for 2.5 hours for two consecutive weeks. I teach the program once a month and have enrollment of 12 to 16 patients. The class is billed as a group physical therapy visit.

The topics covered in the first class are the anatomy of the nervous system, how nerves communicate, and categories of pain based on a model by Clifford Woolf, MD, a leading pain researcher at Harvard.¹ I introduce sensitization and the potential role of stress-induced hyperalgesia in chronic pain.²⁻⁴ Relaxation exercises and aerobic exercise are covered as strategies to reduce sensitization. I guide diaphragmatic breathing and progressive relaxation exercises. Patients are invited to pair up and share with their partner what they would like to do differently in the coming week based on what they learned.

The second class begins with an invitation to participants

CSM CHICAGO: FASIG AGAIN STEPS FORWARD!

For members of the Foot and Ankle Special Interest Group, CSM Chicago was a huge and productive event! Not only did FASIG provide excellent programming, but major announcements were born out of our annual business meeting. The FASIG, like other Special Interest Groups, was created to foster research and promote collaborative discussion about orthopaedic practice and about the foot and ankle in particular. This year, the FASIG accomplished these goals by presenting over 3 hours of information regarding ankle instability and then, using its own resources, by encouraging orthopaedic research with *another* financial grant *and* by implementing an educational component that brings the FASIG directly into the classrooms of our Physical Therapy programs. If you missed it, here are the highlights of the FASIG's impressive list of activities in Chicago:

Programming

Terry Grindstaff, John Meyer, and Todd Davenport captivated 1,500 physical therapists with research information and discussion about ankle instability following ankle sprain. Of note, Prof Grindstaff's research regarding the role manual therapy plays in the rehabilitation of lateral ankle sprains was derived from a FASIG research grant through the Orthopaedic Section. Our presenters discussed current treatment trends and strategies, besides citing a number of studies that continue to demonstrate the underestimated and under-recognized degree of disability related to the very high frequency of ankle injury, the "high ankle" injury in particular. The placement of PT in the sequelae of injury and projected outcomes makes our profession a crucial player.

Current FASIG Officers:

Clarke Brown, President (2010-2013)
Todd Davenport, VP/Program Chair (2011-2014)
Gerard Brennan, Board Liaison (2011-2014)
Chris Neville, Research Committee Chair (2011-2014)
Judy Gelber, Nominating Committee Chair (2009-2012)
Stephanie Albin, Nominating Committee Member (2010-2013)
JW Matheson, Nominating Committee Member (2011-2014)

The primary purpose of the VP/Program Chair is the identification and implementation of programming at each CSM. This person is therefore your contact should you wish to propose a topic or subject area. Tom McPoil was elected to the BOD (Ortho Section) and therefore vacated his seat as the VP; Todd Davenport was appointed to the position.

Judy Gelber agreed to complete Todd's position as Nominating Chair. JW Matheson was elected to the Nominating Committee in the October elections. The purpose of these positions is to develop and nominate candidates for all officer positions within the SIG. This committee is an outstanding starting point for anyone who wants to get involved in the SIG!

Business Meeting Minutes (abbreviated)

Research Grant

The membership voted to authorize a second \$15,000 research

grant to be offered through the Section. This grant is dedicated to a completed study pertaining to the foot and ankle. It is a second grant from FASIG, following a previous and similar grant in 2009.

Curriculum Survey/Task Force

Following up on earlier FASIG directives, the membership voted to establish a task force devoted to the creation and publication of "Guidelines for Minimum Competency of Foot and Ankle Content within the Orthopedic Curriculum of Entry-level Doctoral Physical Therapy Programs." Chris Neville was appointed as Task Force Chair and was directed to present his report by CSM 2013 in Nashville. This project has been sanctioned by the Orthopaedic Section with the help of Gerard Brennan.

As background, previous FASIG officers including Steve Reischl, Steve Paulseth, RobRoy Martin, and Tom McPoil, among others, had contemplated the establishment of certification or credentialing specific to foot/ankle practitioners. The creation of some sort of a credential required a baseline level of knowledge which did not, and to date, does not exist. In an effort to clarify and qualify current educational models and content, a survey process was instigated by FASIG. A sample of entry-level schools participated in a survey that asked about orthopaedic curriculum in their program which was specific to the foot and ankle. Information surveyed included queries about biomechanics, kinesiology, foot function, surgeries, orthotics, exercise, etc. This survey validated a broad base of curricular content. In an effort to provide entry-level programs a mechanism by which they could stream-line, modify, and update their curriculum regarding the foot and ankle, the FASIG endeavored to produce a tool that would effectively provide academicians the rubric, or minimum standards, of foot and ankle knowledge that concerns the practicing physical therapist. Therefore, the impending Task Force will provide foot and ankle information that is the current consensus of educational institutions, derived from the best and most recent and reliable research.

Call to Action

Members, please consider contributing your thoughts and ideas to the FASIG! This can best be done by contacting any of our officers, by contributing directly to this newsletter with commentary, research ideas, or clinical "pearls."

Research Grant

Attention all researchers! Please contact the education department at the Orthopaedic Section if you are interested in applying for the grant devoted to foot and ankle research.

Next CSM

Mark your calendars for San Diego next year! Programming from the Orthopaedic Section will again be second to none! Dates are January 21-24, 2013.

*Submitted by,
Clarke Brown, PT, DPT, OCS, ATC*

ANIMAL REHABILITATION

SPECIAL INTEREST GROUP

PRESIDENT'S MESSAGE

Whew! We successfully made it through another Combined Sections Meeting. This one was for the record books. Officially, 12,654 physical therapists, assistants, students, vendors, exhibitors, and lecturers attended this jam-packed meeting. I'm so impressed that we were all able to attend with minimal, if any, travel delays, especially given the unpredictability of weather and travel in February to and from Chicago!

Of note in Chicago was a Practice Analysis writing day attended by Carrie Adrian, Cheryl Riegger-Krugh, and me. We did get quite a bit accomplished; however, we've hit some roadblocks with data and statistical analyses. Regardless, we're moving forwards with the document.

The highlight of the weekend was Dr. Narelle Stubbs' lecture, Equine Physiotherapy Research Update, Clinical, Pathological, Imaging and Exercise-based Rehabilitation Studies. Always dynamic and thought-provoking, Dr. Stubbs provided a well-rounded survey of the latest equine physiotherapy research, especially that which is being performed at the McPhail Equine Performance Center at Michigan State University, highlighting anatomy, ultrasound imaging, proprioceptive exercise, and taping for facilitation. I'm certain this won't be the last that we hear from Dr. Stubbs. We thank her for taking time out of her busy schedule to speak with our members and others in attendance.

The minutes from the Combined Sections Meeting will be posted to the Orthopaedic Section Web site.

CSM 2013 will certainly be another amazing meeting and we hope that you will join us. Besides our regular membership meeting and educational programming, we hope to be able to offer a preconference course directed to the physical therapist in animal rehabilitation practice. More details to come!

Here's to a safe spring!

Amie Hesbach

ahesbach@ivghospitals.com

Practice Committee and State Liaison Committee

Charlie Evans

cevens@ivghospitals.com

We know you didn't get into this line of work to be politically active, but, unfortunately for us, the legislative environment isn't terribly friendly to physical therapists in animal rehabilitation practice. Soooo, we need a few good men and women to volunteer to serve as state liaisons. Duties of the liaisons might not be any more than what you're already doing: keeping abreast of the current interpretation of your state physical therapy and veterinary practice acts, keeping tabs on animal rehabilitation practices in your state, and serving as a liaison between ARSIG members in your state and your state APTA chapter legislative committee, ARSIG leadership, and APTA state government affairs. Additionally, the AARV (American Association of Rehabilitation Veterinarians) is proposing a parallel liaison system

with which we might collaborate. Contact Charlie if you're interested in helping out!

Here is our most recent list of state liaisons:

Alaska	Laura Culp Elliott...lauraculPELLIOTTPT@yahoo.com
California	Amy Kramer...kramerPT@verizon.net Tanya Doman...tanya@animalrehabilitation.com
Colorado	Carrie Adrian...cadian@aevh.com Deanna Rogers...deanna.rogers@gmail.com
Florida	Stacie Brown...sjbasr@aol.com
Georgia	Lisa Bedenbaugh...lhinerman@aol.com
Kansas	Connie Schulte...connie@medvetrehab.com
Maryland	Steve Strunk...stevestpt@earthlink.net
Massachusetts	Amie Hesbach...ahesbach@ivghospitals.com
Nebraska	Kirk Peck...kpeck@creighton.edu
Nevada	Robyn Roth...robyn@sugarlandranch.org
New Hampshire	Charles Evans...cevens@ivghospitals.com Jennifer Brooks...jenequinept@charter.net
New Jersey	Lisa Saez...lisasaez@comcast.net
New York	Linda McGonagle...lin@animalptcenter.com
North Carolina	Sarah Bauman...s.bauman@live.com
Ohio	Cheryl Riegger-Krugh...crieggerkrugh@walsh.edu Jennifer Reneker...jreneker@walsh.edu
Tennessee	Cassy Englert...cassye@bellsouth.net
Washington	Cindy Benson McGregor...cbenson@pugetsound.edu
Wisconsin	Courtney Arnoldy...carnoldy@svm.vetmed.wisc.edu

PS: This is as up-to-date a list as we have. Please contact Charlie if you believe that your name is not listed OR listed in error OR if you would like to be added to our list. You'll notice that some states have more than one liaison. We certainly do suggest this team approach, especially in large or legislatively-active states.

Nominating Committee

Cheryl Riegger-Krugh (Chair), Jennifer Hill, Nancy Doyle, and David Levine
crieggerkrugh@walsh.edu

Nominations are open for President and Nominating Committee Member! Contact Cheryl if you are interested in serving on a committee or nominating yourself (or another willing SIG member) for elected office.

UPCOMING EVENTS

I AVRPT Symposium, August 12-15, 2012, Vienna, Austria
www.iavrpt.org

Congratulations to Lin McGonagle, David Levine, Jan Steiss, and Narelle Stubbs who will be presenting!

TheraPaw, 3rd Annual Symposium on Therapeutic Advances in Animal Rehabilitation, May 18-20, 2012, Florham Park, New Jersey
www.therapaw.com

Stop! Police!

Are you concerned about the blatant or uninformed misuse of the term “physical therapy” or title “physical therapist” when concerned with the field of animal rehabilitation, ESPECIALLY when a physical therapist or physical therapist assistant is NOT involved in the provision of animal rehabilitation services at that practice or facility? Well, now may be the time for the ARSIG to get involved. If you’re interested (or just plain frustrated) in this topic, please contact Amie (ahesbach@ivghospitals.com) so that we can form a committee and develop an education and action plan.

Newsletter Committee

Lisa Bedenbaugh

Lhinerman2@aol.com

So we’re proposing a new strategy for our quarterly newsletters. One newsletter per year will be devoted to small animal rehabilitation issues and one to large animal rehabilitation issues. We may even focus our efforts on “themes” such as stifle rehabilitation, therapeutic exercise, neurorehabilitation, pharmacology, aquatic therapy, manual therapy, animal behavior, and/or client/rider-focused interventions. We welcome ANY or ALL submissions from our members (and students)! Case studies, client educational handouts, practice resources, treatment pearls, literature reviews—you name it! Please contact Lisa if you have any suggestions or would like to contribute!

2012: The Sky's the Limit!

ORTHOPAEDIC SECTION INDEPENDENT STUDY COURSES

Quality Continuing Education that Fits Your Lifestyle



2012 COURSES*

- ISC 22.1, Education and Intervention for Musculoskeletal Injuries: a Biomechanics Approach (Available late spring 2012)
- ISC 22.2, Osteoarthritis: Linking Basic Science to Intervention (Available summer 2012)
- ISC 22.3, Foot and Ankle (Available fall 2012)

CURRENT COURSES AVAILABLE*

3-monograph Courses

- ISC 20.3, Orthopaedic Management of Injuries for the Performing Artist

6-monograph Courses

- ISC 21.1, Cervical and Thoracic Pain: Evidence for Effectiveness of Physical Therapy
- ISC 20.2, Joint Arthroplasty: Advances in Surgical Management and Rehabilitation
- ISC 20.1, Orthopaedic Implications for Patients With Diabetes
- ISC 19.3, Orthopaedic Issues and Treatment Strategies for the Pediatric Patient
- ISC 19.2, The Female Athlete Triad
- ISC 19.1, Update on Anterior Cruciate Ligament Injuries (Only available on CD.)
- ISC 18.3, Dance Medicine: Strategies for the Prevention and Care of Injuries to Dancers
- ISC 18.2, Movement Disorders and Neuromuscular Interventions for the Trunk and Extremities
- ISC 18.1, Low-Back Pain and the Evidence for Effectiveness of Physical Therapy Interventions (Only available on CD.)



12-monograph Course

- ISC 21.2, Current Concepts for Orthopaedic Physical Therapy, 3rd Edition

HOW IT WORKS

Each independent study course consists of 3, 6, or 12 monographs in a binder along with instructions for completing the final examinations online. If you are unable to complete the final examination online you can request hard-copy materials from the Section office. Monographs are 16 to 58 pages in length and require 4 to 6 hours to complete. Ten multiple-choice review questions are included in each monograph for your self assessment. *Current Concepts of Orthopaedic Physical Therapy*, 3rd Edition, consists of case scenarios and multiple-choice questions. Final examinations consist of multiple-choice test questions. Exams for 3- and 6-monograph courses must be completed within 3 months. Exams for *Current Concepts of Orthopaedic Physical Therapy*, 3rd Edition, must be completed in 4 months.

If notification of cancellation is received in writing prior to the course, the registration fee will be refunded less a 20% administrative fee. No refunds will be given after receipt of course materials.

Many of our courses have limited print quantities available. Some courses may be placed on CD once hard copies are gone. Once a CD is received by the registrant no refunds or exchanges will be given. Please check online or phone the Section office for availability of hard copy vs CD.

EDUCATIONAL CREDIT

To receive continuing education, registrants must complete the examination and must score 70% or higher. Registrants who successfully complete the examination online will be able to print a certificate recognizing the contact hours earned. Registrants completing a hard-copy examination will have their results mailed to them. Fifteen contact hours will be awarded for completion of 3-monograph courses, 30 contact hours will be awarded for 6-monograph courses, and 96 contact hours will be awarded for the 12-monograph course. Only the registrant named will obtain contact hours. No exceptions will be made. Registrants are responsible for applying to their State Licensure Board for CEUs. Please visit our Web site for approval of some courses by CA, NV, OH, OK, TX, and NATA.

REGISTRATION FEES

	Orthopaedic Section Members	APTA Members	Non-APTA Members
3-monograph courses	\$100	\$175	\$225
6-monograph courses	\$190	\$290	\$365
12-monograph course	\$290	\$540	\$540

When you provide a check as payment, you authorize us either to use information from your check to make a one-time electronic fund transfer from your account or to process the payment as a check transaction. For inquiries please call 800-444-3982. When we use information from your check to make an electronic fund transfer, funds may be withdrawn from your account as soon as the same day you make your payment, and you will not receive your check back from your financial institution.

*Course content is not intended for use by participants outside the scope of their license or regulation.



Additional Questions?

Call toll free: 800-444-3982 or visit our Web site at: www.orthopt.org

I am registering for course(s) _____

Name _____ Credentials (circle one) PT, PTA, other _____

Mailing Address _____ City _____ State _____ Zip _____

Billing Address for Credit Card (if applicable) _____

Daytime Phone _____ APTA # _____ E-mail Address _____

Please check: Orthopaedic Section Member APTA Member Non-APTA Member

I wish to join the Orthopaedic Section and take advantage of the membership rate. (Note: Must already be a member of APTA.) I wish to become a PTA Member (\$30). I wish to become a PT Member (\$50).

Fax registration and Visa, MasterCard, American Express, or Discover number to: (608) 788-3965

Visa / MC / AmEx / Discover (circle one) # _____

Expiration date _____

Signature of cardholder _____

Print name of cardholder _____

Registration Fee _____

WI State Sales Tax _____

Wisconsin County _____

Membership Fee _____

TOTAL

Please make checks payable to: Orthopaedic Section, APTA
Mail check and registration form to: Orthopaedic Section, APTA, Inc., 2920 East Avenue South, Suite 200, La Crosse, WI 54601 • 800-444-3982

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FIRST ANNUAL ORTHOPAEDIC SECTION MEETING

MARK YOUR CALENDARS!



The First Annual Orthopaedic Section Meeting, to be held in Orlando FL, May 2 - 4, 2013, was also announced at the Orthopaedic Section Membership Meeting in Chicago, IL. This 2-day meeting will provide a combination of didactic sessions with multiple concurrent laboratory sessions designed to enhance clinical reasoning and psychomotor skills. The program will feature several keynote lectures by nationally and internationally recognized leaders in orthopaedic physical therapy. There will also be plenty of opportunities to network with your peers. Please stay tuned for future announcements regarding the location and program. We hope to see you there!



Orthopaedic Physical Therapy Practice

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